Sept./Oct. 1990 $2.00

MONTANA OUTDOORS

OUR POINT OF VIEW

DAVE BOOKS

THE DEPARTMENT OF FISH, WILDLIFE & PARKS manages Montana's wild resources and the cultural and historic treasures found in our state parks.

Management of Montana's fish, wildlife and parks costs real dollars. However, those dollars are not tax dollars; they are derived from users. Hunters, anglers, and park users support the management and conservation of these treasures.

We think you'll agree that a business that spends $1 to make $10 is a good investment. Our department is just such an investment opportunity. Recent studies by the University of Montana came up with these findings: Hunters, anglers, park users, and snowmobilers spend approximately $335 million each year in Montana—and that doesn't include the cost of their licenses.

The annual budget for our department is approximately $34 million, and that's a 10 to 1 return, with no tax dollars supporting our operations.

We think you'll agree that's a good payback to our state, and we hope you'll continue to support us with your license fees. We'll need that support and more when we enter next year's Legislature with our request to address funding of department programs.

One alternative is cutting back into the muscle of this agency, our staff, and our popular and diverse programs. We're very proud of our history and the wild resources we've managed. Our heritage is important and we're hoping you'll support us if we can continue the good business management of the past coupled with the momentum of a professional wildlife, fisheries, and parks staff dedicated to doing an even better job. We need your help—and we're willing to listen to your ideas and comments.

In the closing months of 1990, a plan for new funding will emerge from a formal public involvement process where funding options and alternatives will be presented for comment and review.

During the next few months, we'll be listening and meeting with our customers all over Montana. I hope to meet you, and I hope you'll invest your time, your support, and your license dollars in an important part of Montana's future—our wildlife, our fisheries, and our parks.

We're big business in Montana, and you are an important and valued stockholder.

Thank you.

K.L. Cool
Director
Montana Department of Fish, Wildlife & Parks

ALAN NELSON

To learn more about "Seekers of Snags," turn to page 18.

State of Montana
Stan Stephens/Governor

Fish and Game Commission
Errol Galt/Chairman
Greg Barkus/Vice Chairman
F.W. Howell
Bob Jensen
William Stratton

Department of Fish, Wildlife & Parks
K.L. Cool/Director
Patrick Graham/Deputy Director for Staff Operations
Al Elser/Deputy Director for Field Operations

Conservation Education Division
Ron Aasheim/Administrator
Vince Yannone/Assistant Administrator

Montana Outdoors Staff
Dave Books/Editor
Kay Morton Ellerhoff/Associate Editor
Donita Sexton/Art Director
Marita Martiniak/Graphic Designer

Montana Outdoors (USPS 360 280), the official publication of the Montana Department of Fish, Wildlife & Parks, is published bimonthly (January, March, May, July, September, and November). Contributions (manuscripts or illustrations) are welcome with the understanding that the department or the editor cannot be responsible for loss or damage. All cootributions will be published at the discretioo of the editor. For subscription information, phone 800/678-6668 (toll-free). Subscription rates are $7 for one year, $12.50 for two years, and $17 for three years. (Please add $3 per year for Canadian subscriptions. All other foreign subscriptions, air mail only, are $22 for one year.) Individual copies and back issues cost $2 each. Although ***Montana Outdoors*** is copyrighted, permission to reprint articles is available by writing our office or phoning us at 406/444-2474. All correspondence should be addressed: ***Montana Outdoors***, Department of Fish, Wildlife & Parks, 1420 East Sixth; Helena, MT 59601. ©Montana Department of Fish, Wildlife & Parks, 1990. All rights reserved. Indexed by States' Periodical Index, 1660 Smithville Road; Havre, MT 59501.

Postmaster: Send address changes to: ***Montana Outdoors***, Department of Fish, Wildlife & Parks, 1420 East Sixth; Helena, MT 59601. Second-class postage paid at Helena, MT 59601, and additional mailing offices.

MONTANA OUTDOORS

September/October 1990
Volume 21, Number 5

FEATURES

2 Harvest Ups and Downs
by Terry Lonner, Bill Hoskins, and Candy Haskins
For hunting and harvesting some game species in Montana, the "good ol' days" are now.

8 Great Day in the Morning
by Gary Turbak, photo by Dave Books
The tales most often repeated in front of a winter's fire are those that happened before noon.

15 Nongame Sampler—"The Coeur d'Alene Salamander: Montana's Cliff-Hanger"
by Dave Genter
This four-inch lungless amphibian calls a steep rock face near Libby home.

18 Seekers of Snags
by Deborah Richie and Susan Reel
Seventy-two species of wild animals in Montana use or depend on snags for nesting, feeding, shelter, or perching.

25 Champion Donates Choice Wildlife Land
by Tucker Hill and Mike Aderhold
Champion International Corporation donated some of the finest lake and forest recreation land in the country to the people of Montana.

27 Perspectives—"Lies My Guide Told Me"
by Greg Tollefson, illustrated by Dave McGee
Guides never lie about the size of fish they catch themselves.

31 Bows, Arrows, and Bulls
by Tom Lemke
Sportsmen continue to debate the pros and cons of archery and how it fits into Montana's elk hunting picture.

35 Giant Springs: The Big Bubbly
by Harley Yeager
Giant Springs Heritage State Park attracts some 250,000 visitors each year.

DEPARTMENTS

11 Catchall
14 Contributors
23 Readers Respond

COVERS

Front Cover—Those in the know rate the pheasant as No. 1 on Montana's upland game bird list. Mission Valley artist **Ron Jenkins** has created a front-cover pheasant painting for this fall issue that is quite a prize in its own right.

Back Cover—Helena artist **Shirley Cleary**'s back cover poster, commissioned by the Montana Chapter of the American Fisheries Society, shows a fishing scene on the Missouri River near Wolf Creek. Sale of the poster will help publicize one of the Society's goals: "Montana's Fishery Resources—For Everyone, Forever."

HARVEST

Ups and Downs

by Terry Lonner,
Bill Hoskins, and Candy Haskins

MONTANA HUNTERS HAVE SEEN MANY CHANGES in hunting regulations and conditions during the last 100 years, but for hunting and harvesting some game species, the "Good Ol' Days" are now.

Public reaction to uncontrolled hunting developed in the Montana Territory before the turn of the century. The first Montana conservation law, passed in 1869, closed the hunting season on introduced game birds. Initial grouse hunting seasons were set in 1870. In 1872, the hunting season on buffalo, moose, elk, deer, bighorn sheep, mountain goats, antelope, and hares was closed from February 1 to August 15 of each year. In 1895, the Legislature established a Board of Game Commissioners and that board established the first bag limits: three bull elk, 100 grouse or prairie chickens, eight deer, eight sheep, eight goats, and eight antelope. By 1897, sale of all game animals and birds was prohibited.

The first state game warden was appointed in 1901 and a Fish and Game Department was first organized. This warden was assisted by eight deputy game wardens throughout the state; at that time, they were the only field employees of the department. During the early 1900s, game laws became increasingly restrictive.

In 1913, the Montana Fish and Game Commission was reorganized and in 1921, codes were established giving the Commission power to open and close seasons. Antelope and caribou became protected big game animals, several counties were closed to elk hunting, and a buck deer season was set for those portions of the state open to deer hunting. Sheep and goat seasons were closed, there was a five-bird limit for upland game birds, waterfowl seasons were set with limits of 20 ducks and eight geese, and black and grizzly bears were classified as predatory animals.

During the late 1930s, the bear was reclassified as a game animal; buck deer seasons were common, but either-sex deer could be hunted in seven counties; the season on sheep and goats was closed unless opened by the Commission; moose, bison, caribou, and antelope were protected by closed seasons; the upland game bird limit was still five birds; and waterfowl limits were 25 ducks and eight geese.

AS THE 1940s APPROACHED, growing public concern for and interest in game management resulted in the need for new approaches, for technically trained people, and for factual information. Creation of a new position within the department in 1940—state big game manager—marked the first step toward development of a scientific game management program. This led to establishment of the Game Management Division within the Montana Fish and Game Department. Although this division is now called the Wildlife Division, and the Fish and Game Department has become the Montana Department of Fish, Wildlife & Parks (FW&P), basic functions have not changed.

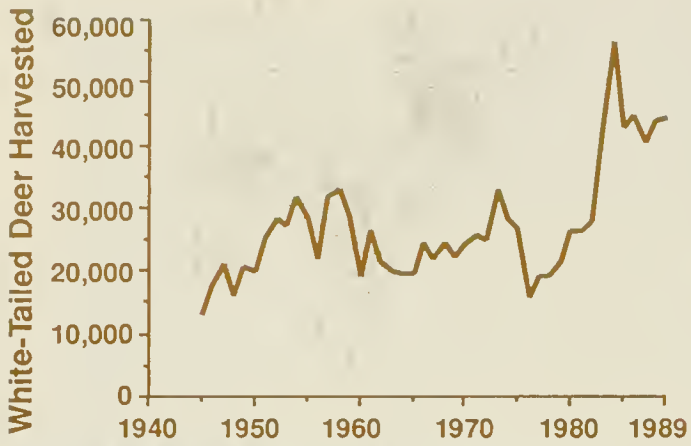
ONE OF THE IMPORTANT FUNCTIONS of the game management program has been to determine game harvests and hunting success. These harvests and hunting surveys are useful *tools* for professional wildlife managers. They have been primarily used for:

- monitoring removal of animals from different populations or areas;
- monitoring trends in harvests over time to alert managers about wildlife problems relative to overharvests, habitat conditions, and crop depredation;
- monitoring annual, as well as trends in, hunting pressure where undesirable congestion of hunters may be occurring; and
- providing biological information such as sex and relative ages of big game animals.

Since 1941, FW&P has conducted game hunting and harvest surveys. If you are a hunter, you probably have had at least one phone call or received at least one questionnaire in the mail from the department. From 1941-57, these surveys were conducted periodically and from 1958-81 annually via postal questionnaires. Before 1982, these surveys were conducted from Helena; since then, they have been conducted by the Wildlife Division's Research and Technical Services Bureau in Bozeman.

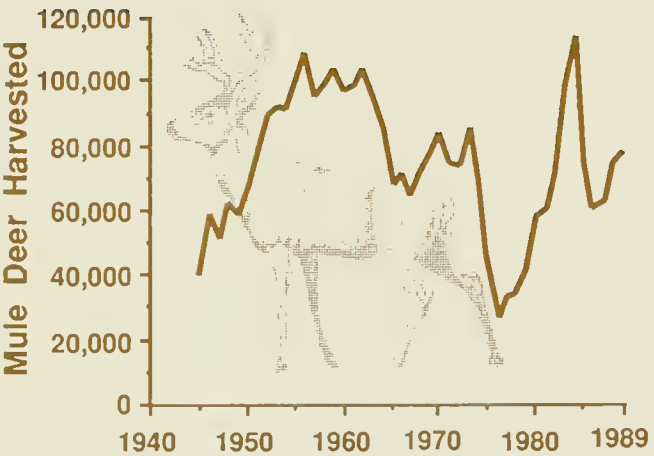
These surveys are still conducted annually, but primarily by telephone; mail questionnaires are still sent to non-residents and to residents without an available phone number. Review of mail questionnaires has shown that results are biased toward

RODNEY SCHLECHT

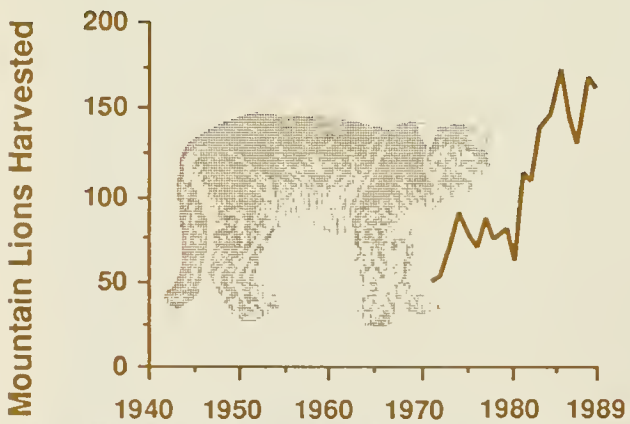


Year of least harvested and (number harvested)—1945 (13,444)
Year of most harvested and (number harvested)—1984 (56,761)
1989 harvest—44,261

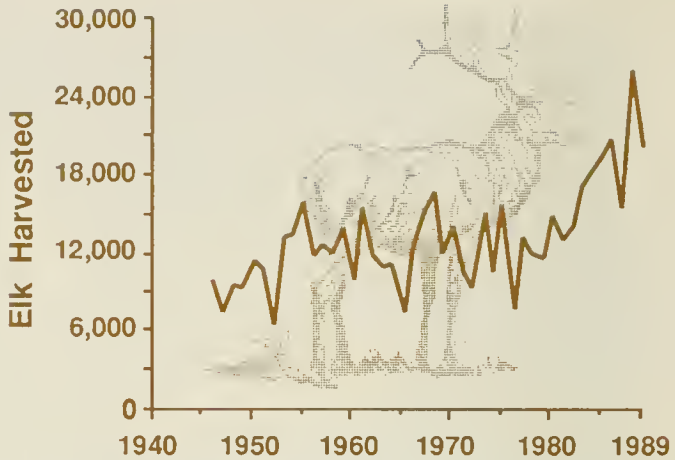
The following statistics are for mule and white-tailed deer hunters combined, since our survey methodology won't allow us to separate them:
Number of deer hunters in 1989—161,972
Number of deer hunter days in 1989—1,072,856
Percent hunter success of all deer hunters in 1989—63



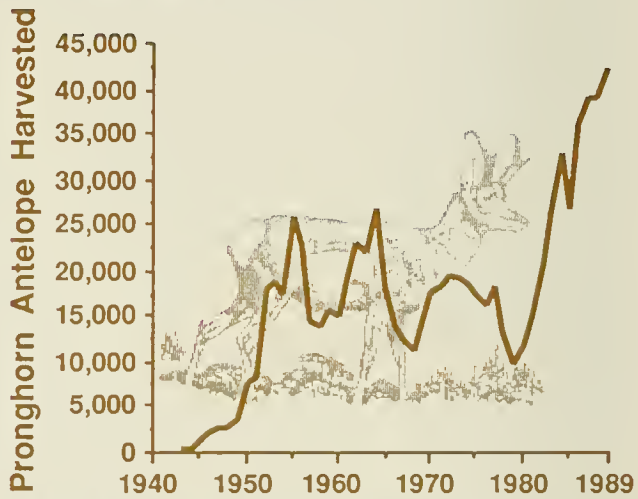
Year of least harvested and (number harvested)—1976 (26,323)
Year of most harvested and (number harvested)—1984 (112,873)
1989 harvest—78,063



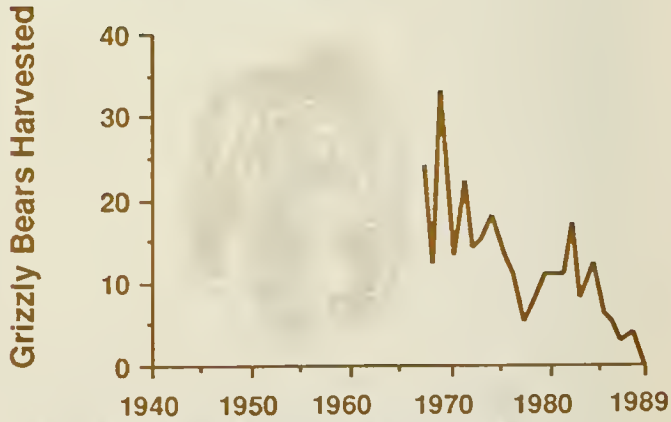
Year of least harvested and (number harvested)—1971 (51)
Year of most harvested and (number harvested)—1985 (174)
1989 harvest—163



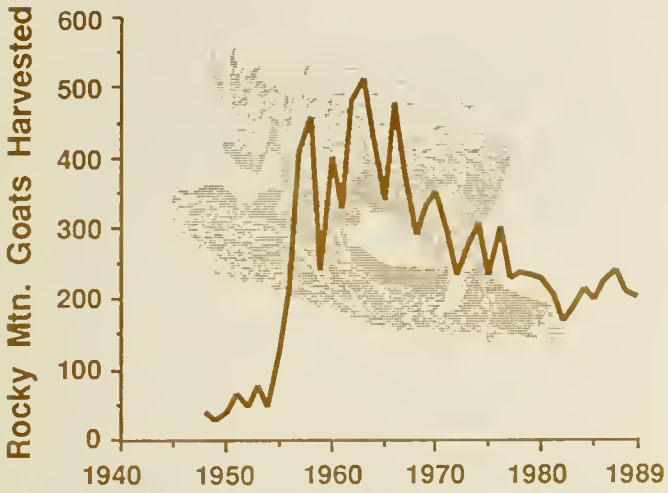
Year of least harvested and (number harvested)—1952 (6,400)
Year of most harvested and (number harvested)—1988 (26,211)
1989 harvest—20,094
Number of hunters in 1989—99,305
Number of hunter days in 1989—752,406
Percent hunter success in 1989—20



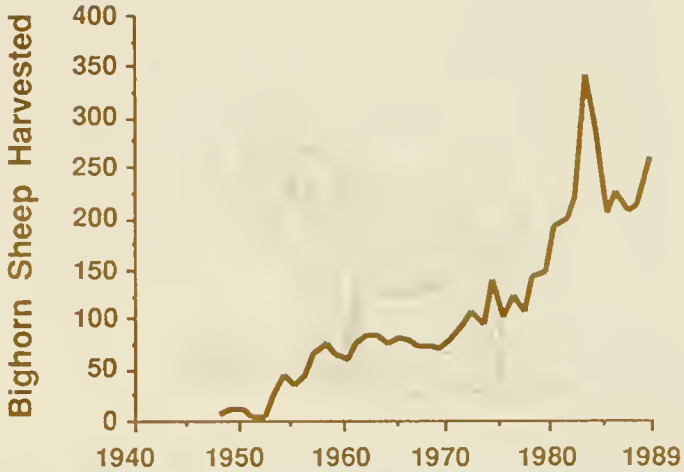
Year of least harvested and (number harvested)—1944 (540)
Year of most harvested and (number harvested)—1989 (41,976)
1989 harvest—41,976
Number of hunters in 1989—41,832
Number of hunter days in 1989—117,441
Percent hunter success in 1989—76



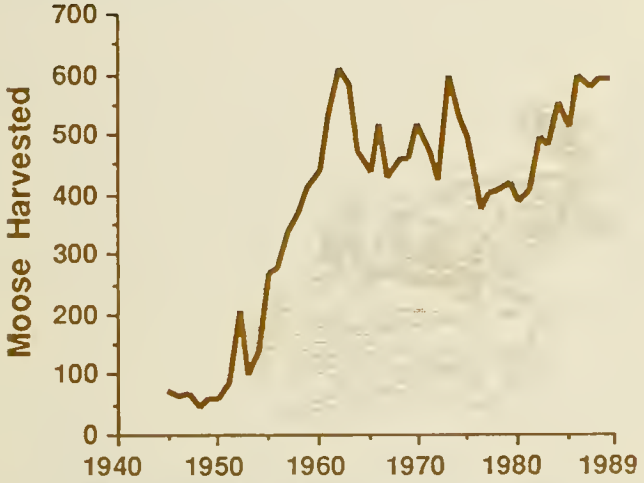
Year of least harvested and (number harvested)—1989 (0)
Year of most harvested and (number harvested)—1969 (33)
1989 harvest—0



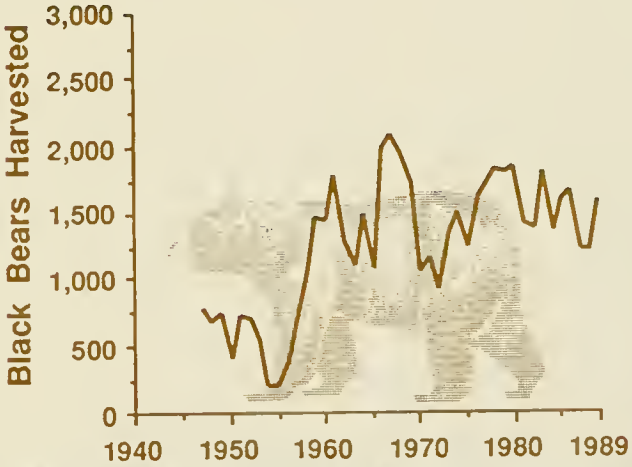
Year of least harvested and (number harvested)—1949 (30)
Year of most harvested and (number harvested)—1963 (513)
1989 harvest—205
Number of hunters in 1989—285
Number of hunter days in 1989—1,376
Percent hunter success in 1989—72



Year of least harvested and (number harvested)—1951 and 1952 (0)
Year of most harvested and (number harvested)—1983 (336)
1989 harvest—255
Number of hunters in 1989—506
Number of hunter days in 1989—2,344
Percent hunter success in 1989—50



Year of least harvested and (number harvested)—1948 (50)
Year of most harvested and (number harvested)—1962 (610)
1989 harvest—595
Number of hunters in 1989—694
Number of hunter days in 1989—4,534
Percent hunter success in 1989—86



Year of least harvested and (number harvested)—1954 and 1955 (200)
Year of most harvested and (number harvested)—1967 (2,096)
1989 harvest—1,669
Number of hunters in 1989—13,633
Number of hunter days in 1989—101,704
Percent hunter success in 1989—12

inflated harvests, especially for upland game birds. This is because successful hunters are more likely to respond than unsuccessful hunters through mail questionnaires. Telephone surveys have reduced this bias and have resulted in more accurate estimates of game harvests since 1982.

In recent years, these surveys have monitored annual harvests of eight big game species (mule and white-tailed deer, elk, antelope, moose, bighorn sheep, mountain goat, and black bears; annual harvests of grizzly bears and mountain lions are recorded through mandatory reporting of kills by hunters); 11 species of upland game birds (pheasants; Hungarian and chukar partridge; sharp-tailed, sage, spruce [Franklin's], blue, and ruffed grouse; snipe; mourning dove; and Merriam's turkey); geese and ducks in general; nine furbearers (mink, beaver, muskrat, badger, coyote, fox, raccoon, weasel, and skunk; annual harvests of lynx, bobcats, and otters are recorded through mandatory reporting of individuals from each species trapped); and falconry activities.

Because of the number of hunting license holders (about 230,000 residents and 32,000 non-residents in 1989), it is impractical to contact all of the license holders for information about their hunting activity. Therefore, random samples stratified by species and license types are drawn. Due to random selection, a license holder may not be surveyed at all or he/she could be surveyed for all licenses. Surveys are conducted during the winter, with results distributed during late spring and early summer.

The quality and accuracy of the results from these surveys and their use in managing game species in Montana depend on the hunting public. If you receive a phone call or questionnaire

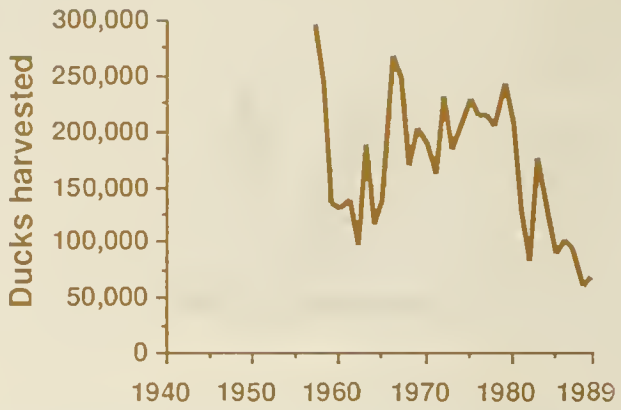
from the department, please take it seriously and respond as accurately as possible.

These graphs depict annual harvest trends of different game species. At the least, these trends are an annual index of animals harvested in Montana since as early as 1943. Harvest variations between years are largely a result of a combination of factors, such as:

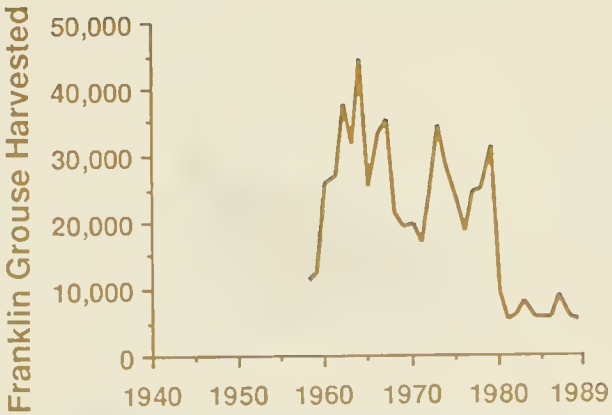
- general increases or decreases in game population sizes;
- annual weather conditions that influence hunting conditions and hunter success;
- increases in hunter numbers;
- more effective hunting techniques;
- changes in hunting regulations and bag limits;
- changes in license fees;
- changes in harvest survey methods;
- annual population fluctuations due to weather conditions;
- habitat losses or gains; and
- use of pesticides.

In recent years, the last three factors have especially

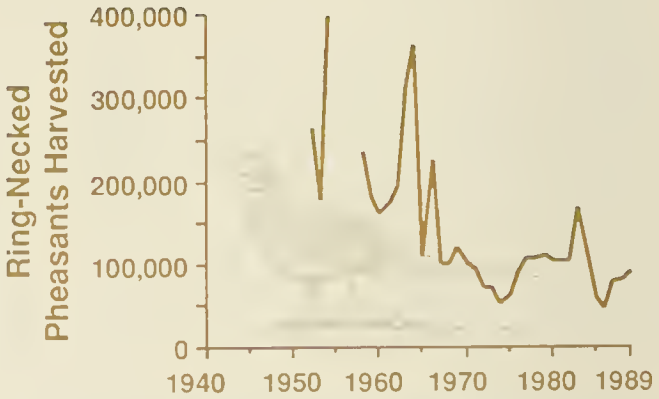
continued on page 26



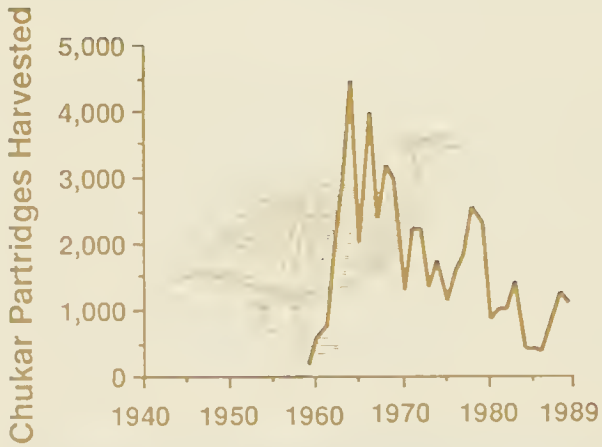
Year of least harvested and (number harvested)—1988 (63,379)
Year of most harvested and (number harvested)—1957 (298,300)
1989 harvest—70,464
Number of hunters in 1989—8,525
Number of hunter days in 1989—61,563



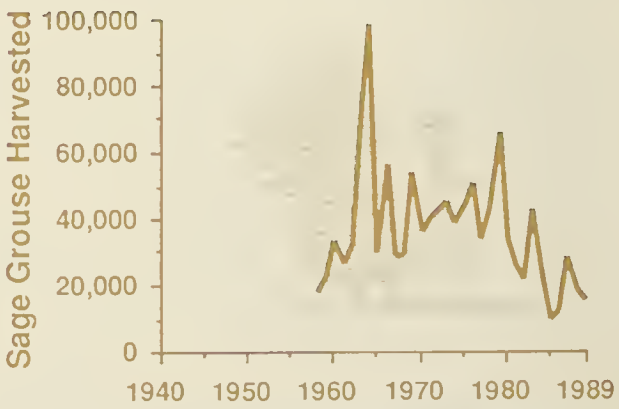
Year of least harvested and (number harvested)—1981 (5,496)
Year of most harvested and (number harvested)—1964 (44,783)
1989 harvest—5,503



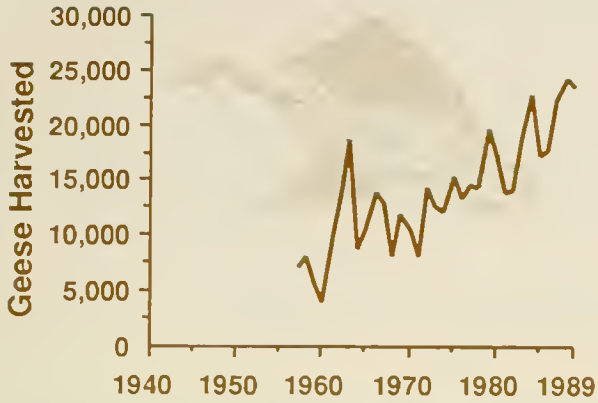
Year of least harvested and (number harvested)—1986 (41,724)
Year of most harvested and (number harvested)—1954 (392,630)
1989 harvest—85,013



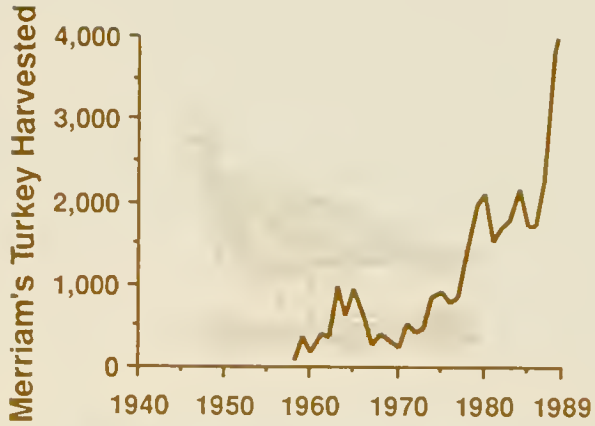
Year of least harvested and (number harvested)—1959 (200)
Year of most harvested and (number harvested)—1964 (4,500)
1989 harvest—1,133



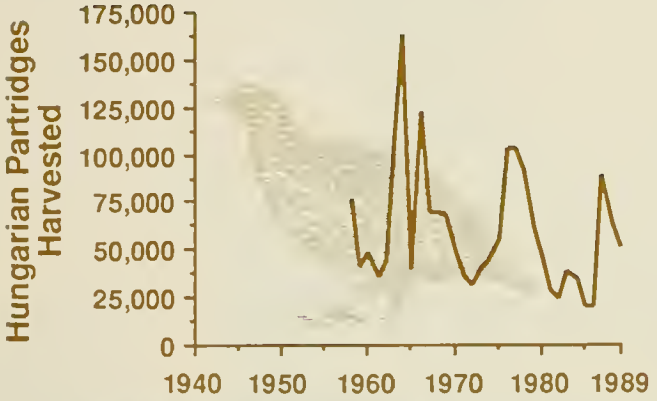
Year of least harvested and (number harvested)—1985 (10,791)
Year of most harvested and (number harvested)—1964 (99,138)
1989 harvest—16,178



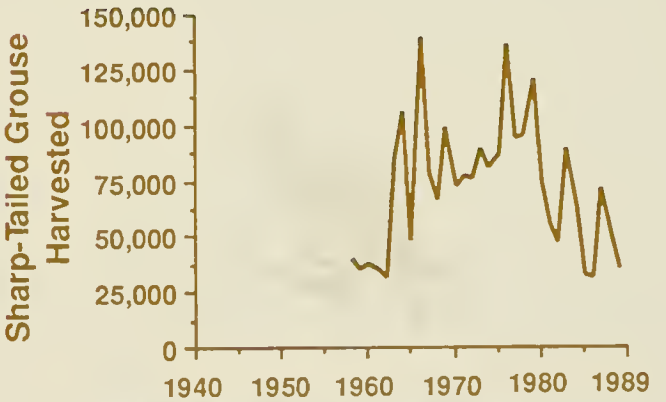
These harvest statistics include both Canada and white geese.
Year of least harvested and (number harvested)—1960 (4,054)
Year of most harvested and (number harvested)—1988 (24,282)
1989 harvest—23,541
Number of hunters in 1989—7,838
Number of hunter days in 1989—58,975



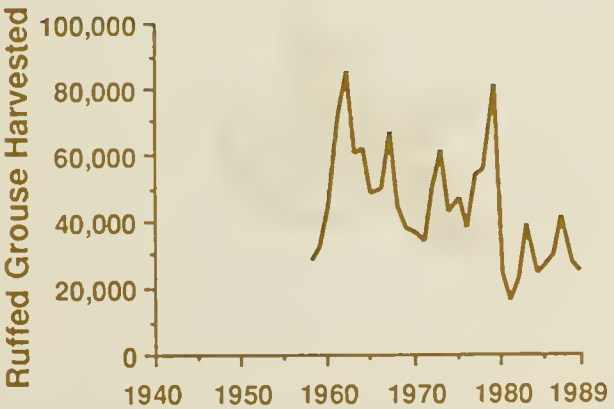
Year of least harvested and (number harvested)—1958 (89)
Year of most harvested and (number harvested)—1989 (4,173)
1989 harvest—4,173
Number of hunters in 1989—8,049
Number of hunter days in 1989—22,678
Percent hunter success in 1989—52



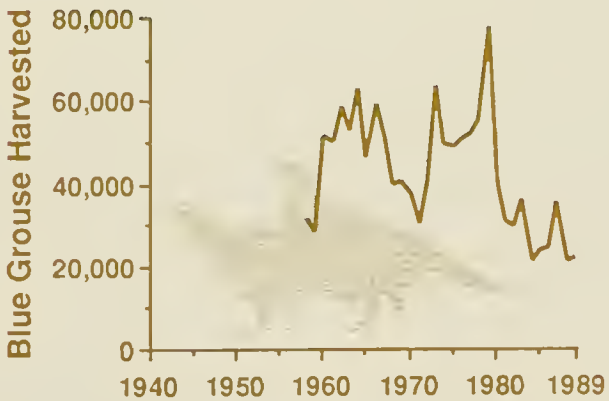
Year of least harvested and (number harvested)—1986 (20,728)
Year of most harvested and (number harvested)—1964 (164,000)
1989 harvest—52,131



Year of least harvested and (number harvested)—1962 (31,826)
Year of most harvested and (number harvested)—1966 (140,585)
1989 harvest—36,240

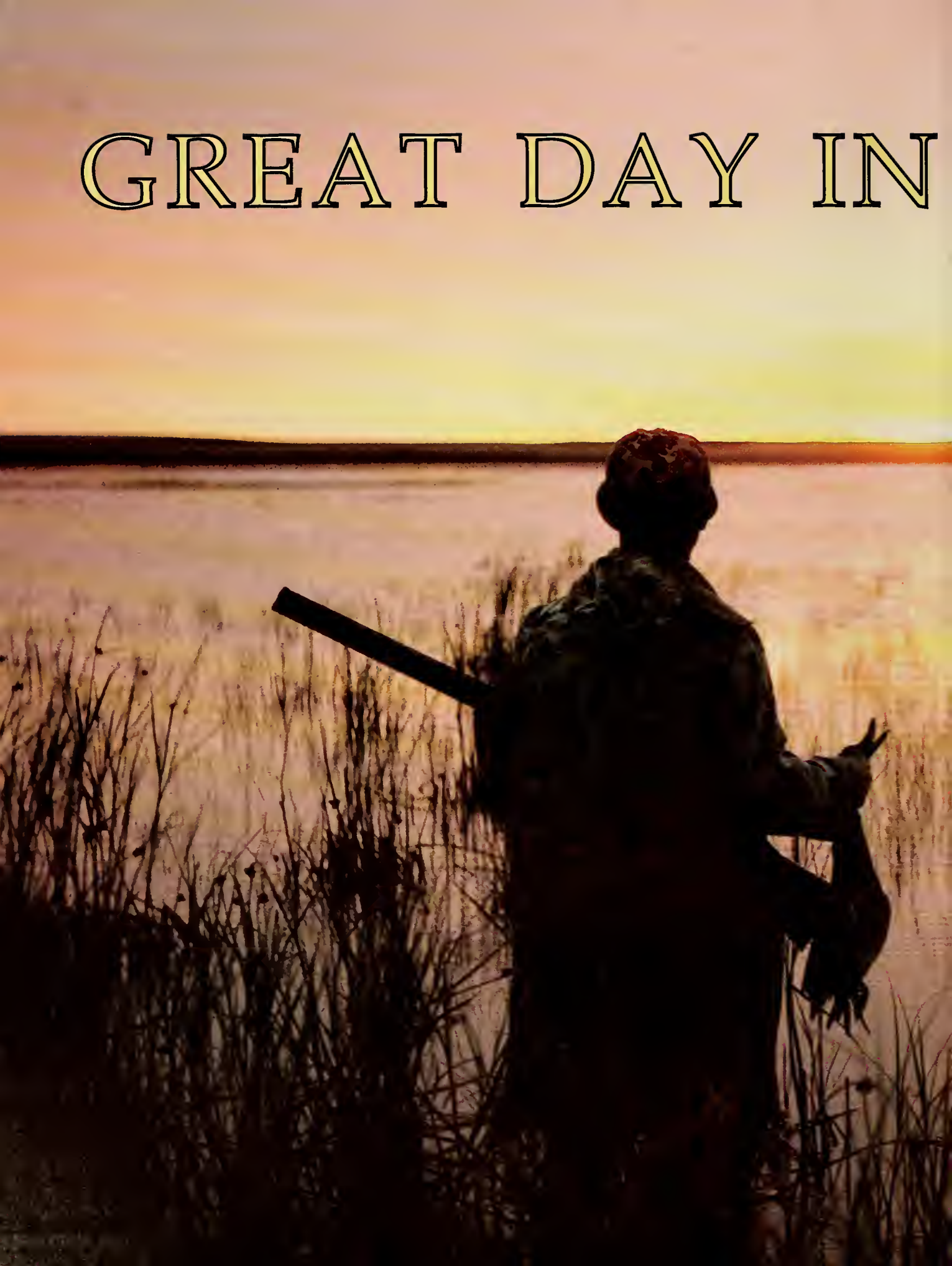


Year of least harvested and (number harvested)—1981 (17,059)
Year of most harvested and (number harvested)—1962 (85,642)
1989 harvest—25,688



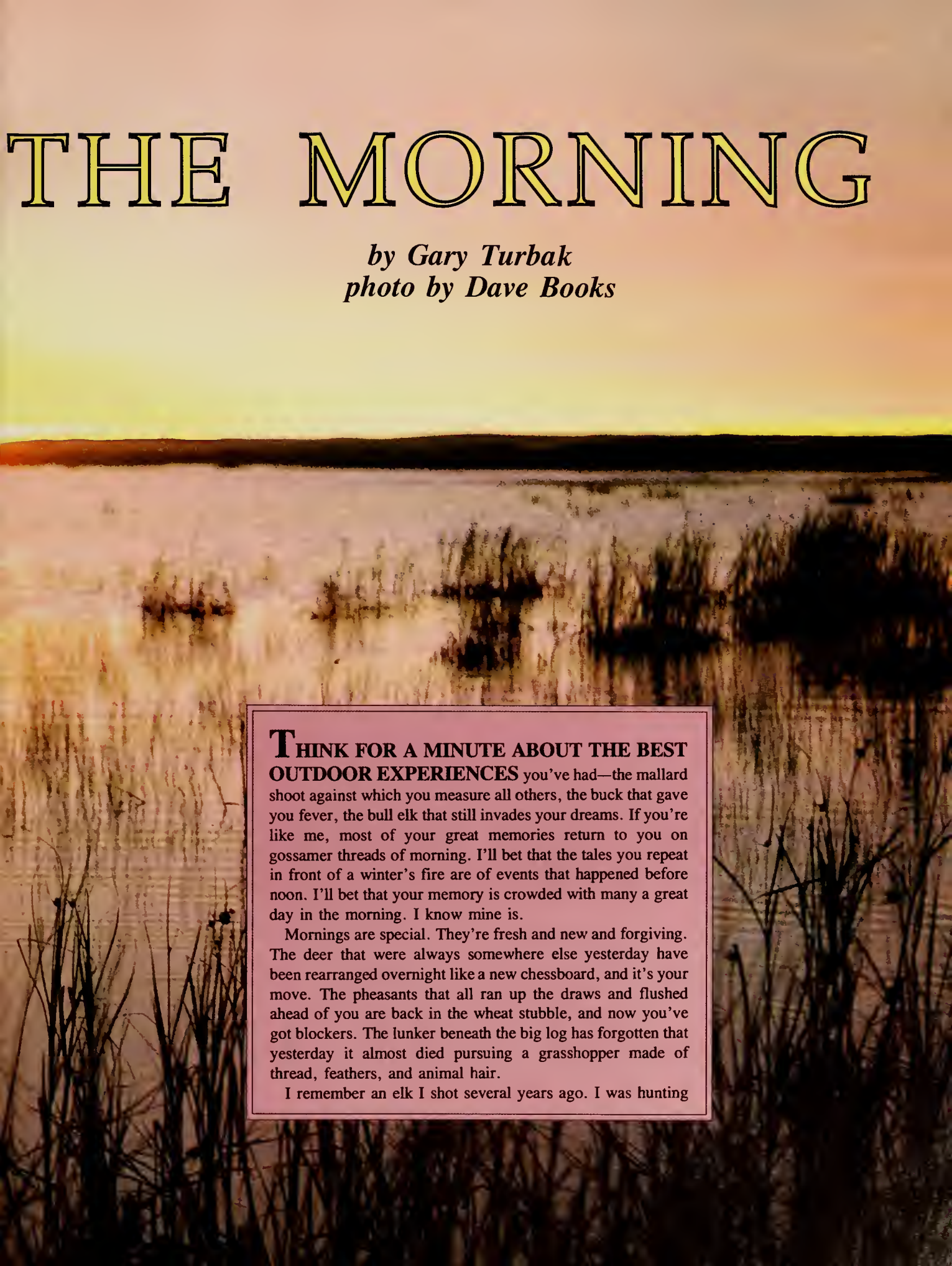
Year of least harvested and (number harvested)—1988 (21,563)
Year of most harvested and (number harvested)—1979 (78,375)
1989 harvest—22,429

GREAT DAY IN



THE MORNING

by Gary Turbak
photo by Dave Books



THINK FOR A MINUTE ABOUT THE BEST OUTDOOR EXPERIENCES you've had—the mallard shoot against which you measure all others, the buck that gave you fever, the bull elk that still invades your dreams. If you're like me, most of your great memories return to you on gossamer threads of morning. I'll bet that the tales you repeat in front of a winter's fire are of events that happened before noon. I'll bet that your memory is crowded with many a great day in the morning. I know mine is.

Mornings are special. They're fresh and new and forgiving. The deer that were always somewhere else yesterday have been rearranged overnight like a new chessboard, and it's your move. The pheasants that all ran up the draws and flushed ahead of you are back in the wheat stubble, and now you've got blockers. The lunker beneath the big log has forgotten that yesterday it almost died pursuing a grasshopper made of thread, feathers, and animal hair.

I remember an elk I shot several years ago. I was hunting

alone that morning on a forested hilltop when I happened upon three cows feeding in a clearing. I sat cross-legged in the snow and watched them for five minutes from a distance of 50 yards. The sun reflected off the snow in brilliant patterns, and the day was warm. Again and again one of the cows stared at me, unable to decide what I was. I had never before been eyeball to eyeball with an elk and for a while the being there became more important than the hunting. Eventually I left my reverie and squeezed off an easy shot, but I shall treasure that morning forever.

It's great to be alive at dawn. I don't know how many times I've watched from a deer stand as the hint of crimson in the east grew into a red fireball, but I still thrill at the sight. Other dawn images flood my mind: mallards set in silhouette against the rising sun. Antlers reflecting light. The sharp cackle of a cock pheasant. Stalking on silent dew-damp grass. Vaporous breath puffing from the nostrils of a whitetail buck. The cold, shiny steel of a rifle barrel. The glint of a broadhead. The eerie stillness of a fog-shrouded lake.

THERE'S A STRICTLY PHYSICAL BEAUTY ABOUT THE LADY DAWN. Anyone who has ever driven through the night into morning can tell you that. A new day can be appreciated even at 55 miles per hour on a humdrum interstate highway. To watch the infant sun spangle the desolation of a winter landscape is to understand a little better the birth of a plant, perhaps the birth of man. The color, the angle, the intensity of the new light make each dawn holy.

First light is a time of hope and possibility. A time when every twig snap is the big buck heading home, when every distant flock of ducks seems headed your way. Those moments when it is no longer night but not yet day lie heavy with anticipation. It is then that we humans can briefly go back to the purely natural world we left eons ago. It is then that we can dream of becoming all that we can be.

I once hunted with a man who felt no need to breakfast before sunrise and to be in the woods at first light. Whenever he got there was soon enough for him. I no longer go afield with that man. I prefer instead the company of those who feel as I do about the dawn. Those who always whisper to preserve its silence; those who love the sound of shotshells being pushed into a magazine in the dark; those who step softly in the predawn blackness.

In a purely pragmatic way, mornings are productive. Pockets of upland bird cover haven't yet felt the feet of previous hunters. Geese leave the lake to feed. Deer return to their bedding grounds. Fish strike more quickly in the chill morning water. The wild world is about its business in the morning.

It was in the morning that my partner and I glimpsed the antelope band on a hilltop a mile away. Through the ravines we crept until only a few hundred yards of grass and sagebrush separated us from the pronghorns. Still unsure whether the band held any bucks, we moved forward on our bellies. So good was our stalk that we soon found ourselves within 60 yards of the antelope, and there were indeed horns in the bunch. Moments later two bucks lay dead, the morning light accenting the black of their cheek patches and the white of their rumps.

It was in the black of morning that we set out mallard decoys on opening day last fall. We sipped a hurried cup of coffee as the minutes ticked down to shooting time. A weasel peeked through the walls of the blind. A dozen deer paraded past. Then the eastern pink announced the beginning of another season, and the naive ducks cascaded into the dekes like kids into Disneyland. Before the day had melted the frost from the cattails, we had limited out.

It was a summer morning when my wife and I slipped from our sleeping bags, grabbed the spinning rigs that leaned against a tree, and walked the 50 yards to the lake. The new sun had not yet hit the water, but the lake threw back a perfect reflection of the mountain setting. The click of a bail. The whir of line playing out. The rhythmic retrieve. Then, wham! Her rod tip bent, and 50 feet away the water exploded. I watched in awe as she drew the fish closer. Just before she landed it, the fish broke water again, and I remember thinking, "My God, there's magic in the morning."

Part of that magic is seeing what we have not seen before. To be about at first light is to catch the wild nations unaware, to mix for a moment our being with theirs.

I REMEMBER ONE MORNING on the shore of a lake. I knelt near a deer trail with bow in hand. A great gray dome of clouds squatted low in the sky, and above the water hung tendrils of fog, wafting and reaching like the fingers of God. The reluctant morning held back, suspending all living things in perpetual dawn.

At some point I sensed that the water was moving. Out of the fog toward me swam legions of mallards. Silently the ducks—there must have been hundreds of them—pressed toward the shore until they filled the little bay. As though called together by some great unseen leader, they floated wing to wing just a few feet from where I knelt, their colors barely discernible in the murky light. I suppose that to them I was but a tree stump, a motionless blob in the fog. I felt privileged to be privy to such a solemn assemblage. It felt good to be invisible, to shed the mantle of an interloper.

In a moment, the silence, broken first by a lone dissenter, gave way to the rising clamor of serious duck talk. The tranquility of the fowl passed quickly into nervousness. In a moment, the mallards turned in unison and swam off into the fog, leaving me alone again on the shore. I thought for a moment that I might have imagined it all, but no, the great mass of ducks had really been there, just a few feet away.

I can only surmise that in the mist-shrouded dawn they mistook the shoreline for some threatless island. I think the agitated quacking questioned that fact, and the overwhelming vote was to move on.

Twenty minutes later, when the fog ran before a puff of wind, the only sign of the mallards was a tight dark line bobbing in the middle of the lake. The deer never came that morning, but it mattered not. The morning itself had been enough.■

A *WILD* Kind of Education

The little girl sat at the computer, the snake draped around her neck, and fed information about deer populations into a program that creates graphs. Across the mountains in another part of Montana, a junior high student arrived at school, entered his room, swerved around a pile of antlers, and placed a colored stickpin on a map. He'd seen an eagle on his way to school and his stickpin joined hundreds of others color-coded by year to show where students had spotted eagles. In the center of the state, a high school class discussed endangered species and

TOM WARREN

Project WILD, a program jointly sponsored by the Department of Fish, Wildlife & Parks and the Office of Public Instruction, lets students learn firsthand about wildlife and nature. Fourth-grader Aaron Sandon (above) eyes a songbird during teacher Marilyn Hayes' bird-watching field trip from Four Georgians School in Helena.

even delved into the global politics of wildlife biology.

What do these classrooms have in common? How have things changed over the last 10 or 20 years? All of these students in all of these classrooms are part of Project WILD—a unique environmental and conservation education program emphasizing wildlife. Project WILD is jointly sponsored in Montana by the Department of Fish, Wildlife & Parks (FW&P) and the Office of Public Instruction (OPI).

At the heart of the program is a group of instructional activities designed for teachers to use both inside and out of the classroom. Although many activities described above might happen even without Project WILD, teachers are motivated by the program. They believe education about the wild things in our environment is vital to a well-rounded liberal education.

Teachers are encouraged to present facts, stimulate thinking about wildlife, and offer situations that ask students to make critical decisions. They seek a balance between information, tradition, and emotionalism. With Project WILD as a tool, students learn about the natural resources available to them, not only in Montana, but throughout the world.

All classrooms have many things in common—but the classrooms described above all have teachers trained in Project WILD and dedicated to the ethic of education as a process, event, and adventure. That is what might be different from 10 or 20 years ago. The tools are different, the decisions are based on more adequate information, and the ability to work together and negotiate differences in opinion is practiced in schools.

Through Project WILD, we hope to instill in our students habits that increase awareness of the things around them. With increased awareness comes a natural quest for knowledge. And with encouragement and someone with whom to share the activities, skills are sharpened and commitment results. A commitment to responsible behavior, constructive action, and informed decisions are examples of things those of us who work with Project WILD strive for.

The first goal is to have fun teaching our kids. Students pretend they are different animals, thus discovering how much they already knew about certain animals. They discover the relationships animals have with each other and with the habitat. Wildlife fascinates almost everyone; in the classroom, wildlife can be a useful tool for motivating students in more traditional subjects like language arts, math, history, and even music. The students' fundamental desire to know about the living things around them and how they work are the

motivating tools a teacher can use to work with students.

Project WILD offers guidance for teachers unfamiliar with their immediate surroundings. Even experienced teachers appreciate Project WILD for its versatility and adaptability to the information they already possess.

If your children are not involved with Project WILD in their schools yet, contact the local FW&P office and inquire about the program. Many youth groups already use the practices embodied in Project WILD. There may be a trained Project WILD facilitator in your area; for information, call Kurt Cunningham, youth education coordinator for FW&P, 406/444-1267, or Bob Briggs, OPI science education specialist, 406/444-4439.—*Deborah Richau, Project WILD facilitator, Billings*

Look-Alike Signs

As you travel through forests in western Montana this fall, you'll see the same kind of signs on U.S. Forest Service, Plum Creek Timber Company, Department of State Lands, Champion International, and Bureau of Land Management lands. Travel management signs on multiple ownership lands has been a problem for years, and many different versions of signs were used to communicate travel restrictions. The result was often more confusion than information.

In a meeting of major land management representatives in summer of 1988, Plum Creek Timber Company proposed a comprehensive road management plan that included standardized signs. After the meeting, the major forest managers in western Montana and the Department of Fish, Wildlife & Parks wrote a Memorandum of Understanding to implement a cooperative road management program. This past year, a steering committee has produced a standard format for the signs and a public information strategy.

The new signs are white or brown in color, 11 inches by 18 inches in size, international symbols portray a picture message, and the reasons for road restrictions are listed. The signs contain the logos of cooperating agencies. The new signs are going up this month, as this cooperative effort replaces previous signing efforts.

The values of travel management to habitat management for wildlife and recreation are well documented. Road use restrictions are now widely accepted in managed forests.

The main emphasis of this new approach is to facilitate public understanding and acceptance of cooperative road management programs. Whether you travel in the Blackfoot Valley, Swan Valley, or Fisher River country, or on Champion, national forest, or state lands, you will see a uniform

system of signs to identify road use status.

What do the land management agencies ask of you? When you see an 11 by 18 white or brown sign along a forest road, slow down, and pull off the main driving lane. Take a minute to read the message. Then remember, each time you see these signs, land managers believe that many benefits can come through management of road use. Land managers are trying to protect water quality, provide wildlife habitat security, and minimize road maintenance. They are trying to make the forest environment a more enjoyable and productive place for your use.—*Jim Cross, FW&P Region 1 (Kalispell) wildlife manager*

New Guide Lists Wildlife Viewing Hot Spots

How many Montanans enjoy watching bighorn sheep on cliffs, wintering elk on a snow-free hillside, or a bald eagle perching in a streamside tree? An impressive 90% of Montanans take trips to watch wildlife, according to a U.S. Fish and Wildlife Survey.

A new book helps direct Montanans and visitors to wildlife viewing hot spots from one end of the state to the other. In fact, the 1990 "Montana Wildlife Viewing Guide" establishes a network of 113 viewing sites marked by roadside signs. The six-inch by nine-inch book tells viewers how to get there, what species of wildlife to look for, whether the site has interpretive signs, and what kinds of facilities and other recreational opportunities to expect. Symbols, regional color codes, and maps make this 104-page book "user-friendly."

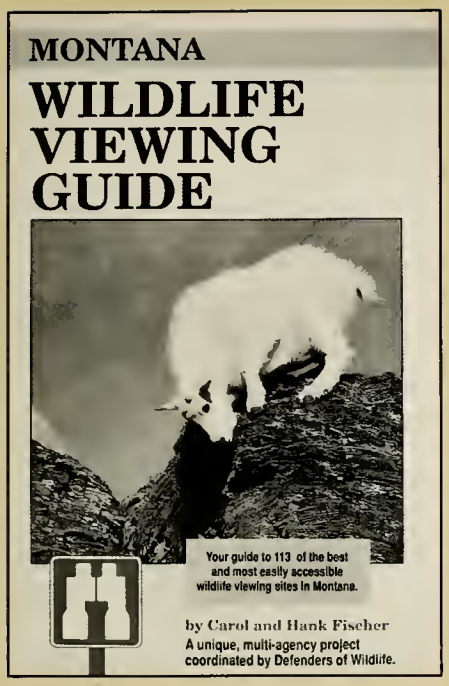
The Montana Department of Fish, Wildlife & Parks (FW&P) joined more than 10 other agencies, including the U.S. Forest Service and the Bureau of Land Management, and private wildlife groups in funding and researching the guide. Carol and Hank Fischer assembled the information, using the two-year-old "Oregon Wildlife Viewing Guide" as a model. Hank Fischer is the Defenders of Wildlife representative in Missoula. Falcon Press chose Montana to kick off a watchable wildlife series for other western states, and Idaho and Utah's guides followed Montana's.

The Montana sites represent a sampling of the best in the state. Outstanding color photographs and illustrations showing wildlife in different habitats (cottonwood river bottom, prairie grassland, etc.) add to site descriptions.

Here are a few examples of sites: Rocky Mountain Front Eagle Migration Area (where more golden eagles have been seen in one day than anywhere else in the country); Freezout Lake Wildlife Management Area (where some 200,000 snow geese stop during migration); and the KookKooSint Sheep Viewing Area (a wayside bighorn viewing area near Thompson Falls with excellent interpretive signs). Also included are fish hatcheries, urban parks, a canoe trail, and even a restaurant.

Obviously, Montana possesses far more than 100 wildlife viewing locations. After all, this state boasts more then 600 species of wildlife and fish, including some species like the grizzly bear that have long disappeared from many other states. Montana is wildlife wealthy.

Some potential sites deemed too sensitive to human disturbance were purposely left out. However, those sites


MONTANA
WILDLIFE VIEWING GUIDE
Your guide to 113 of the best and most easily accessible wildlife viewing sites in Montana.
by Carol and Hank Fischer
A unique, multi-agency project coordinated by Defenders of Wildlife.

included must still be treated with care. Every one who uses this guide should study the section on responsible wildlife viewing. Simply watching can be harmful to wildlife if people move in too close for a photograph or try to feed animals. The results may be tragic: abandoned nests, young separated from parents, or wildlife driven into oncoming car traffic.

Why encourage wildlife viewing if there's a chance of disturbing wildlife? The opportunities to add to people's knowledge of wildlife and appreciation for nature's diversity far outweigh risks. Also, once wildlife viewers learn about the needs of wildlife, most people are more than willing to be respectful.

Partly in response to the growing demand for viewing wildlife, FW&P is developing a special program called "Montana's Watchable Wildlife." The program's purpose is to encourage conservation of wildlife by enhancing public understanding and appreciation for all wildlife species and their habitats. The department also views watchable wildlife as an excellent means to attract new sources of funding and support for wildlife, particularly for the lesser known nongame species.

The next challenge for managers of viewing sites will be to devise creative ways to increase the educational value of the sites. FW&P manages one-third of the sites, either entirely or in part. Nature trails, interpretive signs, brochures, and naturalist tours are all possibilities. Any development must also be appropriate to the site. Sometimes no development may be the best choice.

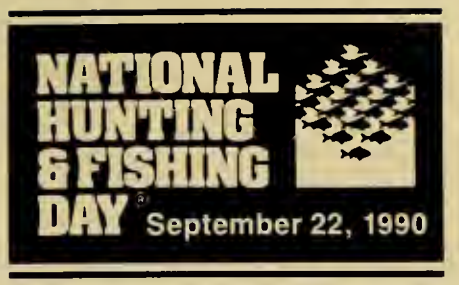
Many sites also have the potential to help the economies of local communities. Once visitors learn there is more to see than Glacier and Yellowstone National parks in Montana, they will be tempted to slow down, look for wildlife in other places, and spend money in nearby towns. A recent study revealed that the No. 1 reason people come to Yellowstone is to view wildlife, ranking even above seeing the geysers. Another study showed that in 1985 alone, wildlife viewers from out of state spent $31 million in Montana.

Some communities in Montana have already come up with innovative ideas related to wildlife viewing. For example, the Helena Chamber of Commerce is planning a bald eagle celebration to welcome the return of an anticipated 300 to 500 eagles this November on the Missouri below Canyon Ferry Dam (also included in the viewing guide). More than 200 eagles feasted on spawning kokanee salmon there last year and biologists believe this year's gathering will increase dramatically. The chamber is working closely with a committee of biologists to make sure the celebration adds to people's understanding of an endangered species.

The cooperative effort it took to produce the new wildlife viewing guide resulted from agencies and groups acknowledging the tremendous interest in wildlife. Most people live in Montana because they like to see or to know they are surrounded by magnificent wildlife. The guide serves first as a useful companion to a roadside geology book or to hiking, hunting, or angling guides. Beyond that, the guide and the roadside signs ought to spark ideas of how to foster economic growth through promoting and conserving our priceless wildlife heritage.

"Montana's Watchable Wildlife" may well be on its way to becoming one of this state's catchiest phrases for the 1990s.

The wildlife viewing guide costs $5.95 and is available at bookstores, outdoor stores, and FW&P offices. Proceeds from books sold at department offices go into a fund for watchable wildlife.—*Deborah Richie, nongame information specialist, Conservation Education Division, Helena*



Saturday, September 22, marks the 19th annual celebration of National Hunting and Fishing Day, a day set aside by Congress to officially recognize the role sportsmen play in conservation and to make the public aware of the need to conserve the nation's fish and wildlife resources.

Throughout the nation, millions of individual sportsmen and sportsmen's clubs will celebrate the day through activities at rifle ranges, schools, shopping centers, and wildlife management areas. The men and women involved in these activities voluntarily contribute their time and efforts, recognizing that the future of hunting and fishing depends on public understanding of and support for wise conservation practices.

Hunters and fishermen helped found the conservation movement, and they requested taxes on their equipment and special license fees to provide money for programs to help wildlife. Sportsmen throughout the country annually contribute over a half billion dollars to conservation of fish and wildlife resources through license fees, taxes on hunting and fishing equipment, and user fees. In Montana during 1989, hunting and fishing license sales totaled approximately $19 million.

On this day set aside to celebrate our rich wildlife and fishery resources, make a personal commitment to share the outdoor experience with a person who might otherwise never have the opportunity. A friendly invitation to attend or even help out at an event organized for National Hunting and Fishing Day in your community might be all it takes to spark or renew an interest in conservation. Spending time with youngsters is an important link to recruiting future conservationists. Take a kid fishing and hunting or, better yet, set up a fishing clinic or a hunter education class for your area.

Just get folks involved—exposure is a critical component to ensuring that a Montana tradition continues.—*William Phippen, information officer, Conservation Education Division, Helena*

CONTRIBUTORS

• It's been a while since *Montana Outdoors* readers have seen a **Ron Jenkins'** cover, so this one—featuring Montana's No. 1 upland game bird, the pheasant—is especially welcome. His work has been exhibited all over the country and in our pages many times, including the paintings that accompanied the "Identification of Montana's Upland Game Birds" in Sept./Oct. 1982. Jenkins has moved from Missoula to the Mission Valley near Charlo where there's lots of scenery and wildlife to inspire his art.

* * * * *

• In 1901, the first state game warden was appointed, and a Montana Fish and Game Department was organized. In the ensuing years, hunters have seen some "Harvest Ups and Downs." But as the article that opens this issue on page 2 emphasizes, the "good ol' days" might well be now. The article also contains a series of graphs which show annual harvest trends. Authors include **Terry Lonner**, assistant chief of the Wildlife Division's Research and Technical Services Bureau, Bozeman; **Bill Hoskins**, a programmer/analyst in the same bureau who works primarily with harvest surveys; and **Candy Haskins**, the bureau's statistical technician.

* * * * *

• **Gary Turbak** is someone who believes it's great to be alive at dawn. He cherishes mornings—they're special, new, and forgiving. He recalls dawn images such as mallards set in silhouette against the rising sun. Turn to "Great Day in the Morning" on page 8. Turbak, a free-lance writer who lives in Missoula, enjoys hunting, fishing, camping, skiing, and getting up early.

* * * * *

• "The Coeur d'Alene Salamander" truly is "Montana's Cliff-Hanger." A rock face above U.S. Highway 2 near Libby is home to the largest and most extensively studied population of the tiny salamanders in the state. But the area was also at the heart of a multimillion-dollar highway project. So 550 of the salamanders were captured and held in climate-controlled rooms at Washington State University in Pullman until they could be returned to the moist rocky slopes they need to survive. As **Dave Genter** writes, if all goes well, "the released salamanders will be out foraging again in the spray zones and seeps." Genter is coordinator of and a zoologist with the Montana Natural Heritage Program; turn to his "Nongame Sampler" installment on page 15.

* * * * *

• Woodpeckers drill holes in the dead pine tree. Beetles tunnel through. A family of northern flying squirrels nests within. Snags are an integral part of an ongoing cycle of life and death in the forest. And **Deborah Richie** and **Susan Reel** estimate that 72 species of wild animals in Montana use or depend on snags for nesting, feeding, shelter, or perching. Turn to "Seekers of Snags" on page 18. Richie is the department's nongame information specialist; Reel works as a wildlife appreciation biologist for the Lolo National Forest.

* * * * *

• Montanans are richer in the form of 3,917.83 acres of choice wildlife land donated by Champion International Corporation. The land stretches in bits and pieces for 23 miles along U.S. Highway 2, beginning 34 miles east of Libby and extending to 28 miles west of Kalispell. It is an area unusually rich in wildlife and recreational opportunity. "Champion Donates Choice Wildlife Land" (page 25) was co-authored by **Tucker Hill**, Missoula, Champion's director of public affairs for the western region, and **Mike Aderhold**, the information officer for Fish, Wildlife and Parks Region 1 (Kalispell).

* * * * *

• A fishing guide needs to know a lot of answers. Or, as **Greg Tollefson** speculates, a guide needs to be able to manufacture answers to questions on topics ranging from geology to hydrology. Since guides are advertised as experienced and knowledgeable trout finders, many customers think that means guides know everything there is to know. Turn to this issue's "Perspectives" on page 27. Tollefson is a free-lance writer and fishing guide in Missoula. *MO* readers have become familiar with **Dave McGee's** drawings. We think you'll agree they aid and abet the humor in Tollefson's treatise, "Lies My Guide Told Me." McGee works as a structural technician for Thomas, Dean and Hoskins, Inc. in Great Falls; he also operates D.M. Graphics from his home (4004 Fifth Avenue North; Great Falls, MT 59401).

* * * * *

• Montana's first archery season was held in 1968; that year, slightly over 2,000 licenses were sold. In 1987, more than 10 times that number of licenses were sold—22,037. As **Tom Lemke** writes, "During this period, sportsmen have debated—sometimes vigorously—the pros and cons of archery and how it fits into Montana's elk hunting picture." Beginning on page 31, "Bows, Arrows and Bulls" does a comprehensive job of looking at archers, their attitudes toward elk management, and their reasons for hunting with a bow. Lemke's article is based on a Wildlife Division report, "Effects of Archery Hunting on Elk Management in Montana." He credits success of the report to the Elk Species Committee members, the crew at the harvest survey office in Bozeman, game managers in neighboring states and provinces and, most of all, 8,569 Montana bowhunters who cooperated in providing information. Lemke is a biologist for the Wildlife Division based in Livingston.

* * * * *

• Some 250,000 people each year can't be wrong. They visit the Giant Springs Heritage State Park complex. And as **Harley Yeager** points out in his article, "The Big Bubbly" is one of the main attractions—it spews as much as 192 million gallons of water per day. But it's only one of many attractions at the site—others include Giant Springs Trout Hatchery, the Roe River (recognized by the Guinness Book of World Records as the world's shortest river), scenic overlooks, the department's Region 4 Headquarters and its Visitor Center, and much more. Yeager is the FW&P information officer for the region, and his article begins on page 35.

* * * * *

• *MO* thanks the following photographers for their contributions to this issue: **Craig Groves**, Boise, Idaho; **Mike Logan**, Helena; **Alan Nelson** and **Rodney Schlecht**, Great Falls; **Keith Szafranski**, Livingston, and **Craig Jourdonnais**, **Tom Warren**, and **Harley W. Yeager** who work for the department.■

The Coeur d'Alene Salamander

Montana's Cliff-Hanger

by Dave Genter

WATER FELL FROM THE ROADSIDE CLIFFS in streams and trickles, creating a misty spray. It was a primeval setting, with mosses and ferns growing from the rocks. Spiders, worms, and insects glistened in the flashlight's beam. Bedecked in bright rain gear and broad-brimmed hats, we moved along the cliff face, stalking our unlikely quarry. After two hours of searching in the cold September air, we had captured about 60 small salamanders.

Occasionally a motorist would stop to ask what we were doing at the roadside cliff. Folks in Libby and Troy knew what was going on out along Highway 2 near Kootenai Falls. Although few had ever seen the Coeur d'Alene salamander, most would recognize it by name. The species had made a reputation for itself in northwestern Montana and northern Idaho.

The Coeur d'Alene salamander *(Plethodon idahoensis)* was unknown to science until 1940, when it was discovered at Lake Coeur d'Alene in Idaho's Panhandle. In the 1960s, the detection of two populations in Montana made little more than a note in a scientific journal; in fact, the lungless amphibian continued to be an obscure denizen of the Northwest until the early 1980s.

At that time, a group of Idaho scientists was studying the Coeur d'Alene salamander to determine its status. To their dismay, they found few new populations and could not locate several that were previously known. Two of the five Montana sites had been disturbed by logging, and several Idaho sites were targeted for hydropower development. As a result, in 1983 the scientists petitioned the U.S. Fish and Wildlife Service (USFWS) to list the Coeur d'Alene salamander under the Endangered Species Act.

The ensuing battle put the USFWS in an awkward but familiar position: that of dealing with a species for which information is scarce and opinions plentiful. Unlike the spotted owl debate, this exchange took place among academicians and herpetologists rather than loggers and environmentalists. The controversy pitted "old-school" herpetologists against "progressive" scientists and conservationists and revolved around two issues: whether the Coeur d'Alene salamander was threatened by extinction, and whether indeed it was a distinct species.

After much argument and little data to support any decision, the old guard won out. The Coeur d'Alene salamander was not listed as threatened and endangered, and, rather than being considered a separate species, it was classified as a subspecies of Van Dyke's salamander.

"You could have every one of them in Montana together and it wouldn't even fill this bottle of Gallo," said the late Larry Thompson during a 1985 discussion on the Coeur d'Alene salamander. His statement made a graphic impression on those present as to just how rare this four-inch salamander was. Few could argue the point; Thompson, the pre-eminent naturalist and field biologist in Montana, had done most of the searching up to that time. Since then, extensive surveys have been conducted throughout northwestern Montana and northern Idaho by the Montana and Idaho Natural Heritage programs in cooperation with the U.S. Forest Service and Washington State University.

These studies have provided much information on the life history, habitat requirements, and distribution of the Coeur d'Alene salamander. Additional genetic studies at the University of Idaho have clearly demonstrated it to be a distinct species—which is not surpris-

NONGAME SAMPLER

ing, since it has been isolated from coastal populations for several million years.

BECAUSE COEUR D'ALENE SALAMANDERS ARE LUNGLESS, they require a continually moist environment for respiration through their skin. They depend on a unique combination of environmental conditions that simulate those present in the Tertiary period, some 10 million years ago. Prime habitat is found in waterfall spray zones, seeps running over rocky outcrops, and talus scree at the margins of small streams. Fractured belt bedrock formations provide necessary sites where Coeur d'Alene salamanders can hibernate in winter and estivate during droughts and hot summer months.

These microhabitats are productive areas with dense vegetative mats and abundant invertebrate prey. The salamanders emerge at night or on rainy days to forage on nocturnal insects, worms, and snails, enabling them to avoid predation and desiccation. However, the cool night temperatures can restrict salamander activity; if the air temperature drops below 45°F, they retreat to the crevices.

While temperature and moisture play key roles in determining habitat suitability, Coeur d'Alene salamander distribution is equally a result of glacial history. Plethodon salamanders, with more than 130 species worldwide, constitute the largest family of salamanders. The family name "plethodon," which means "many teeth," derives from the distinctive clusters of teeth at the back of the mouth. Currently, there are 20 species of plethodon salamanders in the United States and Canada; seven of these are found in the Pacific Northwest. These salamanders were once found throughout the region in warmer, wetter periods. During the Pleistocene, many species were restricted to unglaciated valleys. Because they could reoccupy habitat behind receding glaciers, the more mobile species distributed themselves widely. Others, such as the Coeur d'Alene salamander, found conditions too arid and inhospitable to recolonize former habitat. The species is currently restricted to unglaciated valleys below 5,000 feet in northwestern Montana and northern Idaho.

Coeur d'Alene salamanders are small and relatively long-legged, with a yellow or orange dorsal stripe. The background color is always black. Toes are short and partially webbed. The Coeur d'Alene is most easily confused with the larger and more common long-toed salamander *(Ambystoma longicauda).* The latter, which uses its lungs to respire, is found in damp terrestrial habitat, whereas the Coeur d'Alene is more restricted to wet spray zones. However, the easiest distinction between the two may be in the name—long toes.

Salamander courtship may not rival the excitement generated by rutting elk or sparring bighorn sheep, but it is a fairly elaborate and ritualized event nonetheless. During September, males approach females snout-to-snout and engage in a form of foreplay that can best be likened to "necking." Eventually the male gets in front of the female, twitches his tail, and deposits a cone-shaped gelatinous sperm packet known as a spermatophore. The female advances and picks up the packet with her cloaca (a chamber at the base of the tail where digestive, urinary, and reproductive systems meet). The female will hold this sperm package through winter and fertilize her eggs the following May. She guards her young deep in the rock fissures until August or September, then emerges at the surface with her inch-long offspring. She will not breed again until the following fall. Unlike Montana's other three salamander species (the tiger, Pacific giant, and long-toed), the Coeur d'Alene has no aquatic larval stage; it matures in three or four years, eventually reaching four to six inches in length.

IT WAS DURING THE WANING DAYS of the annual fall breeding cycle that we were out along Highway 2 collecting salamanders from the cliff face. They were feeding heavily in preparation for winter hibernation, and this was the first time many of the females had eaten since retiring underground to lay their eggs in May or June. It would be an unusual winter for the salamanders captured that night, since they were destined for laboratory quarters at Washington State University in Pullman.

The stretch of rock face above Highway 2 near Kootenai Falls is significant for the Coeur d'Alene salamander. It is home to the largest and most extensively studied population in the state. It was also of great interest to the Montana Department of Highways when we made our collecting foray in the fall of 1988, because it was located at the heart of a $22 million highway reconstruction project between Libby and Troy. Plans called for blasting 3 million cubic yards of rock out of this face. Things looked bleak for the salamanders, since proximity to the railroad tracks and the Kootenai River Canyon left few options for mitigation.

Again, federal agencies faced a dilemma; this time the Forest Service was on the hot seat. The U.S. Fish and Wildlife Service had approved the project, since it would not be likely to harm bald eagles, grizzly bears, or peregrine falcons in the area, and the salamander was not listed under the Endangered Species Act. Both Montana and Idaho had it listed as a "species of special concern," but this designation affords little protection for most nongame species. However, the Forest Service considered the Coeur d'Alene salamander as a "sensitive" species in Region One (Montana, northern Idaho, and North Dakota), giving it much the same protection as a threatened species. A potentially unpleasant situation was developing, particularly in Libby, where concerns over the project brought up comparisons to the infamous snail darter (the small fish in Tennessee that held up construction of Tellico Dam).

In an effort to resolve the problem, the Kootenai National Forest and the Montana Department of Highways agreed to have the salamanders removed from the blasting site, held in captivity, and returned after blasting was completed. In eight nights, more than 550 were captured. Because of road construction delays, they had to be kept in climate-controlled rooms at Pullman until the following September—longer than this species had ever been

CRAIG GROVES

The Coeur d'Alene salamander, a four-inch-long, lungless amphibian that lives near waterfalls and rocky seeps, is a rare inhabitant of northwestern Montana.

kept in captivity. They hibernated in cold temperatures and awoke to eat fruit flies when the temperature was turned up to 45 degrees. Some even laid egg masses—the first ever seen. During their long hibernation, about 180 of the salamanders died.

Although the highway blasting had not yet been completed, on two warm nights last September the remaining salamanders were released at several seeps above the blasting zone. If all goes well, the blasted cliff site will retain its surface water flows and soon develop a new carpet of mosses, and the released salamanders will be out foraging again in the spray zones and seeps.

Aside from protecting the local population from the impacts of blasting, this exercise provided new insights into Coeur d'Alene salamander demographics. All salamanders are difficult to count in the wild. Plethodons are particularly troublesome because they spend so much time deep underground and are nearly impossible to mark for recapture studies. Based on earlier counts, it appears population estimates tend to be conservative, or low.

Even so, many of these populations are isolated and have fewer than 100 to 200 individuals. Many species would face sure extinction with such a small, isolated gene pool. But salamanders have evolved slowly and apparently are not as susceptible to inbreeding and genetic drift. Each population that has been isolated for perhaps tens of thousands of years represents a potentially different direction in evolution to deal with changing environments and conditions.

A species that is seemingly so insignificant often prompts the question: What good is it? This question is not easily answered for those who would ask. Perhaps this species can provide a cure for a rare skin or respiratory disorder. Not likely, but possible. It certainly represents what Montana and the northern Rockies used to be. Amphibians are declining throughout the West because they are so sensitive to change. They are increasingly used for monitoring acid rain, climatic change, and global warming. Beyond any potential utility of the Coeur d'Alene salamander, such species are part of the great and ponderous machine we call life.■

SEEKERS OF SNAGS

by Deborah Richie
and Susan Reel

FROM A DISTANCE, the dead tree appears as lifeless as a bronze sculpture. Burnished and smooth, the twisted wood spirals toward the sky amidst the living pines. Close up, the dead pine pulsates with life. Woodpeckers drill holes. Beetles tunnel through decaying wood, and a family of northern flying squirrels nests within.

Seventy-two species of wild animals in Montana use or depend on standing dead trees—snags—for nesting, feeding, shelter, or perching.

We might assume that because so many animals depend on snags, these dead trees are plentiful. Unfortunately, snags are perhaps one of the most threatened components of the forest environment. They are cut for firewood, for safety, and sometimes simply to meet our standards of beauty.

In our own yards, we mow and rake grass, prune trees, and lop off dead branches. A wild forest is not a tidy place. Bark, limbs, and deadfall litter the ground and snags clutter the world, or so it seems.

Twenty years ago, good forestry practices required cleaning up the woods. Foresters worked to see that every tree was living, growing vigorously, and spaced at regular intervals.

Today, most foresters and wildlife biologists recognize that snags form an integral part of an ongoing life-death cycle. As snags decay and slowly turn into soil, they add life-sustaining nutrients to the forest. A steady supply of snags in all stages serves the wildlife that depend on them.

Just as a tree grows from seedling to

ALAN NELSON

full maturity, so does a snag decay in stages. At every stage the snag is useful to particular kinds of wildlife. As its shape diminishes, so does its wood, from hard and heavy to spongy and light. How fast a snag deteriorates depends on the tree species, the weather, and the decaying agents at work. In the ancient forests of the Northwest, some snags remain standing for 300 years.

Wildlife biologists often group snags in nine stages of decay, relating each stage to wildlife use. For simplicity, let's look at three general stages for a 100-foot tree. First, when a tree dies, its bark loosens, needles or leaves fall, and wood-boring insects start to attack the hard wood. Several things happen:

- Loose bark offers shelter for tiny creatures like bats and offers nest sites for brown creepers, pocket-sized birds with decurved bills.
- Limbs free of greenery become ideal song posts or perch sites for birds. A flat-topped snag serves as a nest platform for an osprey.
- Wood-boring beetles start to transform the snag's interior. They bore into and eat the inner bark (cambium) and lay eggs, which grow into wood-chewing larvae. Bacteria and fungi ride in on beetles and begin to dissolve the wood, sometimes staining it blue.

Second, the tree loses all its bark and most limbs. The top breaks off as the wood softens from the industry of insects. The smooth trunk becomes riddled with woodpecker feeding holes. Look for large, rectangular feeding sites of pileated woodpeckers.

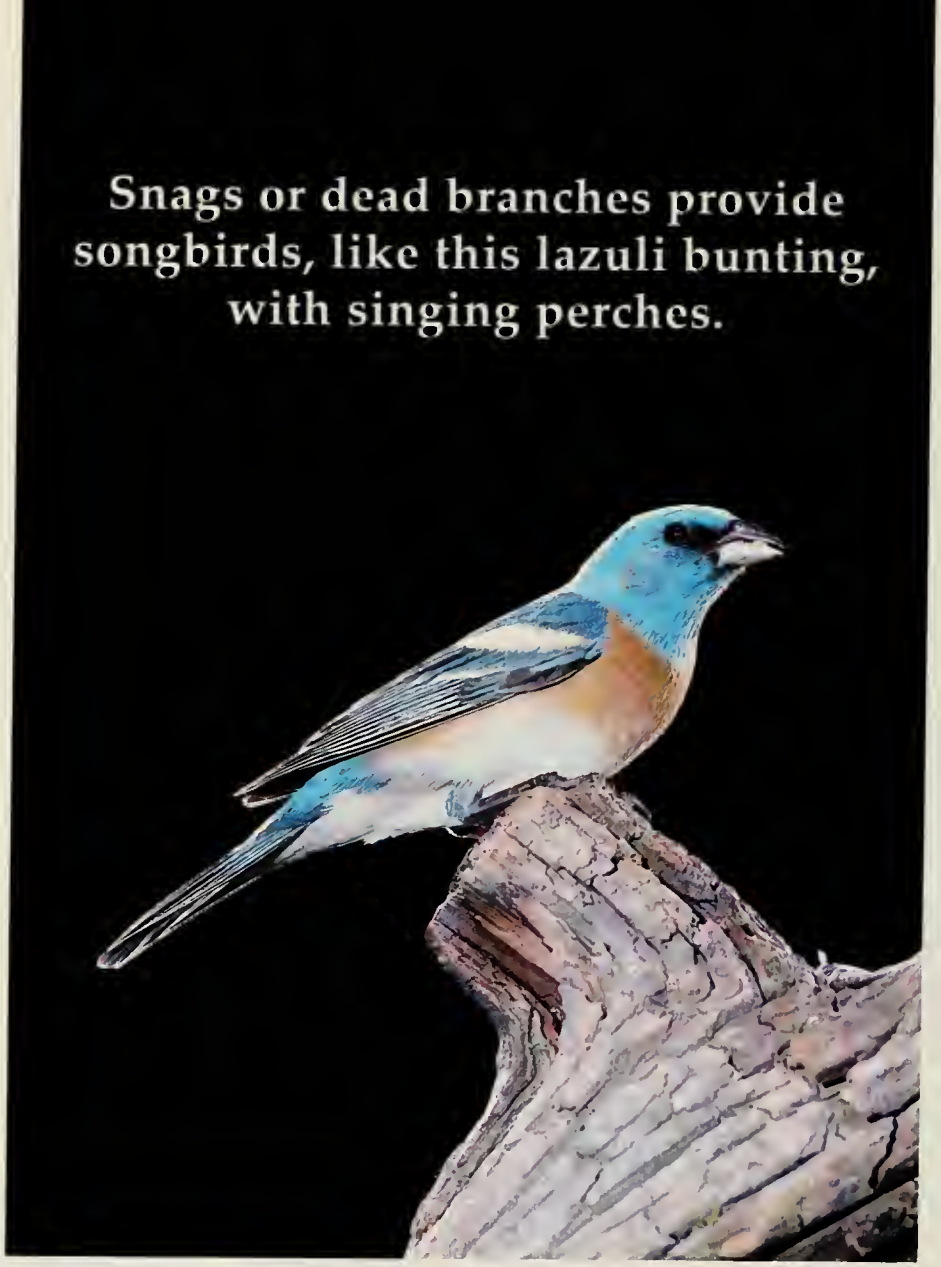
Third, the snag has lost much of its original height and rises only to a modest 20 feet or less. The wood is so soft you can tear it off by hand. Ants swarm, perhaps agitated by a recent visit from a bear that tore into the soft wood to feast on them. A silver-haired bat may be roosting in the hollow interior. The snag's flat top becomes an ideal nesting spot for a great gray owl.

In every stage of snag decay, wildlife find shelter: between bark and tree, in natural cavities, or in woodpecker-

KEITH SZAFRANSKI

Dozens of bird species use snags for nesting, feeding, shelter, or perching—from pileated woodpeckers (far left) to great gray owls (left) and Vaux's swifts (below).

ALAN NELSON



Snags or dead branches provide songbirds, like this lazuli bunting, with singing perches.

ALAN NELSON

excavated nest holes.

It's summer and midday in a western Montana forest. The air lies still and pungent with pine and fir. You're feeling drowsy. A flash of red-black-white breaks the air and a kik-kik-kikik-kik-kik cuts the silence. A woodpecker the size of a crow flies in undulating swoops from the towering larch snag.

One-quarter of all bird species that nest in the Rocky Mountain forests use snags, including many of the birds that live in Montana year round.

Birds that dig their own nest holes are primary cavity nesters. Almost all are woodpeckers, birds marvelously adapted for life on tree trunks. Most have zygodactyl feet (two toes in the front and two in the back) for gripping trunks, stiff tails that work as climbing props, and long tongues that extract insects burrowing in the wood. To drill holes in trees takes heavy bills. Woodpeckers create a new nest cavity each year, remove excess wood chips, and lay eggs directly on the remaining chips. Excavating nests also serves as a courting ritual that leads to pair bonding, one reason why nest boxes will not serve the needs of woodpeckers.

The pileated—largest woodpecker in North America—picks its nest tree with care. No snag under 20 inches in diameter will do. The land surrounding the favored tree must also carry abundant snags and downed trees for feeding. Biologists believe pileateds need at least a 100-acre nesting nucleus of old growth forest and about 500 acres of foraging room per pair.

Shaken by the resonating call of a pileated woodpecker, you stare at the tangle of willows between you and the elusive bird. You hesitate, then plunge from the main trail onto a white-tailed deer path, duck under a few limbs, trip over a branch, and emerge in a grove of ponderosa pine and black cottonwood by the river's edge.

All primary cavity nesters must face the task of figuring out which snags are

soft in the center, the heartwood. In a living tree, heartwood lacks living cells, and reserve materials like starch have been removed or converted into harder substances. When a fungus enters a living tree through a wound, it decomposes the heartwood. Woodpeckers test trees for heart rot by pecking and listening for a distinct resonance.

The impressive size of a pileated woodpecker allows it to drill harder snags more easily than smaller members of the family, like hairy or downy woodpeckers.

The Lewis' woodpecker reserves its drilling powers for soft snags only. This pink-bellied, robin-sized bird will whirl into the air to snatch insects and also caches nuts and seeds in bark. Breeding mostly in western and southern Montana in river bottoms and forest edge, mated pairs may return to the same nest cavity year after year. The male selects the nest site, often in a dead branch of a live tree.

The pileated has vanished. You find a flat, granite boulder protruding from the river's edge and lie on your back, gazing up at trees crisscrossed, green, brown, gray, gnarled, squat, tall, straight, leaning...and there, a dead branch bends with the weight of a belted kingfisher poised for action.

While woodpeckers compose the bulk of primary cavity nesters, the chickadee also digs into soft snags with its thin bill. These energetic birds scoop out rotten wood, fly away with it, and scatter the chips. Then, they refill the nest hole with moss, feathers, hair, insect cocoons, or soft plant material. The male feeds the female while she incubates from six to eight eggs. A female approached on a nest hisses like a snake.

Abandoned woodpecker holes and natural cavities frequently become homes for a surprising variety of mammals and birds, including pine martens, flying squirrels, ducks, owls, kestrels, bluebirds, tree swallows, nuthatches, and Vaux's swifts. These creatures are secondary cavity nesters.

You discover a dark, wide hole high up in a cottonwood snag and daydream about the hooded merganser that might have raised young there, imagining the first plunge for the chicks from tree to rapids...splash. The kingfisher is just surfacing from its fast dive and flies back up to the perch, empty-billed, its fine crest raised. You settle back too, falling asleep to a tap-tap-tap on wood and rush of water.

Vaux's swifts return to Montana each spring from a sunny winter in Mexico. Everything these birds do connects with motion, speed, flight. Even when constructing their nests, they break off twigs as they fly past them. Hurtling down into the hollow top of a snag, they zoom into the darkness, hovering as they glue twigs onto the inner wall with saliva. Twenty-one days after the three to six young hatch, they will join their parents in similar nerve-wracking dives into snag hollows.

The northern flying squirrel also lives in hollows and often chooses abandoned pileated nest holes for a den, or builds a small twig nest on the branches. The squirrels mate in late March to May and young are born a month later. The mother raises a litter of four or five young for two months until they are weaned. Common, yet hard to see, these nocturnal squirrels find the best living conditions in Montana's higher, moister forests and in cottonwood bottomland.

Dusk falls. You're heading home. Swallows and bats cruise above the river, dipping to snatch flying insects. A bird shaped like a jet darts from the sky toward a broken-topped pine snag. You cringe, anticipating the terrible thud. Nothing. No noise. No bird.

Another snag user difficult to see, the brown creeper blends into the tree as it creeps up trunks poking for spiders in bark crevices. No other bird in North America nests quite like the brown creeper—a snag nester, but not a cavity nester. It suspends a hammock of bark, twigs, and moss between a loose piece of bark and the trunk. By selecting a snag that has the upper edge of bark firmly attached and the lower edge lifted away, it keeps rain off its nest. Creepers

For a great tree death comes as a gradual transformation. Its vitality ebbs slowly. Even when life has abandoned it entirely it remains a majestic thing. On some hilltop a dead tree may dominate the landscape for miles around. Alone among living things it retains its character and dignity after death. Plants wither; animals disintegrate. But a dead tree may be as arresting, as filled with personality in death as it is in life. Even in its final moments, when the massive trunk lies prone and has moldered into a ridge covered with mosses and fungi, it arrives at a fitting and noble end. It enriches and refreshes the earth. And later, as part of other green and growing things, it rises again.—Edwin Way Teale

Just as a tree grows from seedling to full maturity, so does a snag decay in stages.

most often nest in Douglas-fir and Engelmann spruce snags. Since dead trees lose their bark, creepers depend on a continuous supply of new snags.

Plentiful snags also mean bountiful roosting and sleeping quarters for wildlife. Some roost alone, others pack tightly together; some perch on branches, others settle into tree holes. Finding a tree cavity may mean survival for a bird when winter temperatures plummet. One of the largest reported cavity roosts is that of pygmy nuthatches in northern Arizona—167 birds.

Where once a Vaux's swift darted, now two shapes glide toward the shaggy old snag and land sprawled, face forward. The northern flying squirrels scramble 30 feet to the top and you see them sail off into darkness.

Wildlife that aren't sleeping or nesting inside snags may be using the outside of snags for action. Red-tailed hawks, bald eagles, eastern kingbirds, and belted kingfishers perch on snags where they can easily see and swoop on prey. Bald eagles often choose the tallest snag on a river stretch or lake shore to scan for ducks or fish. Overhanging branches on creeks become diving boards for kingfishers hunting minnows. Eastern kingbirds and olive-sided flycatchers flit from perches to capture flying insects.

Snags or dead branches on bushes also provide songbirds with singing posts. Males advertise their presence and defend their territories from perch sites. Lazuli buntings return each year to the same willows they used the year before. From the tips of dead branches, they chase other males or launch into song.

You muse on a squirrel that launches into the air without wings, carried only by skin stretched taut between front and back legs. As you stumble along the shadowy trail leading out of the forest, you feel eyes peering from holes within snag spires. A great horned owl hoots five soft notes. You return the call. Notes float into the living night.

With brilliant buntings on display and round-faced owls peering from cavities, it might be simple to overlook a tiny seeker of snags. Carpenter ants tunnel into the base of snags. They feed on eggs and larvae of western spruce budworm and Douglas-fir tussock moths in nearby conifers, thus serving as an important natural control to these two insects that eat conifer needles. You can find carpenter ant colonies by telltale sawdust piles left from their diggings or by watching where pileateds feed.

Carpenter ants make up a major part of a pileated's diet. When the woodpecker pounds on a snag or log, the disturbed worker ants will rush out to defend the colony only to confront a thick, ready bird bill. Flickers, Williamson's sapsuckers, as well as bears, skunks, mice, and shrews search for carpenter ant colonies.

All seekers of snags form links in a forest chain, a chain that is much longer and more complex than we know. Beetles bore into a dying tree carrying fungi that will start heart rot, a rot that allows woodpeckers to excavate nesting cavities to be used over and over by a multitude of wildlife. Snags breathe life into a wild forest.

Snags need to be appreciated. That means changing perceptions. Can decay be considered fascinating and wonderful? Take a walk in the forest; seek out snags. If you know a snag well, follow it through the years, watch the changing cast of wildlife characters there. See what moves into abandoned woodpecker nest holes. A woodrat? A western screech owl? A bluebird? Discover the majesty of trees, the living and the dead. ■

Dreaming of Those Mountains

What follows is the story of a wonderful vacation I had in Montana several years ago.—*C.V. Peterson; Tacoma, Washington*

Dreaming of Those Mountains

During July of 1959, I received a telephone call from my brother Al who at that time was sheriff of Teton County. He was planning on taking a short vacation/fishing trip into the North Fork of the Sun River later in the month. He added, "Would you care to go along?"

I had worked in Forest Service fire camps in various places in the Sun River country—Home Gulch, Hannon Gulch, West Fork, Two Shacks, Lick Creek, etc.—in the summer of 1919 and had never been back into that beautiful country. Now I had an invitation to take the trip of a lifetime into the beautiful country I had envisioned seeing again for years.

On the day we were scheduled to start out, I left my home in Deer Lodge early in the morning. It was a beautiful day, no wind and no clouds—made-to-order weather for an outing. Driving over the rolling hills around Wolf Creek and Augusta, the air was so clear and still that horses and cattle one-fourth of a mile or more away looked close enough to walk over and touch.

On my arrival at Choteau, I found Al had arranged to have the two saddle horses and mules we were to use, plus camp equipment, hauled to the old Frazer Ranch on Deep Creek southwest of Choteau. After securing the needed groceries and a little bit of snakebite remedy, Al and I took off for the picturesque old ranch.

We camped for the night, close to the old log ranch building. After a campfire supper, a good night's rest, and a hearty campfire breakfast, we saddled our horses, packed the two mules, and took off up Deep Creek.

We hadn't gone very far when an adult coyote came out of the timber just below us and traveled along as though he was a member of our party. He crossed the trail several times, both ahead of and behind us, stopping now and then to nose around things of interest only to such creatures. His coat shone as though it had just been combed and waxed, and he paid no attention to us except to glance up once in a while when we spoke to him. After traveling along for a mile or so, he disappeared as suddenly as he had appeared.

Continuing up the trail—which at some places was quite steep and rugged—low branches on trees and bushes had white stuff hanging from them, as though a band of sheep had gone through and left some wool behind. Rounding a sharp bend in the trail, a bunch of 25 or 30 mountain goats appeared. When they saw us, they scattered, but most of them stayed close enough for us to get some good pictures. Apparently, they had been down in the brush rubbing off some of last winter's heavy coat.

Many people interested in wildlife would pay a big price to see what we had already seen, but the day was not yet over. We soon passed a cow elk standing motionless and silent in the timber while we passed, probably feeling that she was not seen. No doubt she had a calf near by.

After crossing the divide, we headed down toward the Sun River. Suddenly, a half-grown black bear went crashing out of the timber into an open area where we could see him traveling in high gear. We must have scared him badly, as he did not decrease his speed or stop to look back during the time it took for him to again go into the timber 400 or 500 yards away.

When we reached the Sun River, we found a good camping spot with an open park and a supply of grass for the stock. We crossed to the west side of the stream, unloaded and unsaddled the stock, gave them a small tidbit, and turned them loose, with my horse dragging a long halter rope. After the tent was set up and the groceries and "housewares" unpacked, Al started a fire and started cooking supper. I took my fly rod and started out to get some fresh fish for dinner. This task was taken care of shortly, when two nice trout, apparently as hungry as we were, succumbed to my toothsome fly.

What a day this had been. We had been on our horses for about 12 hours. We had passed through beautiful country few people are privileged to see. We had seen many forms of wildlife, had caught trout for our supper in a few minutes, and shortly we would crawl into our sleeping bags alongside this fast-moving stream.

The following forenoon I took my camera and fly rod and started upstream, hoping to get some good pictures and also to hook onto some bragging-sized fish. I had not gone far when I saw a cow elk wading up the river ahead of me. I followed about a hundred yards behind her, until she came to a deep pool. I sat on a rock for about 15 minutes while she splashed around in the water, got out on the bank, shook herself, and left. I released the fish I caught and left Al to get fish for supper. (Actually, he wasn't too interested, because he was so happy to be in his beloved mountains.)

After breakfast the following morning, I started upstream as I had the day before. After going half a mile or so, about 25 elk came trotting out of the timber and headed into a pool in the river which was almost swimming depth for them. They jumped around, playing like a bunch of kids swimming and splashing.

After supper and close to sundown, Al and I were lying on our sleeping bags in the tent. I heard a loud snort coming from the horses or mules. I stepped out of the tent to see what might be the reason—not 25 feet away were three very large grizzly bear cubs. A few feet farther away was a large bear of a color similar to that of the cubs. Still farther away was a fifth bear, larger yet, and of a darker color. I hurriedly ran to the tent to tell Al, and he came out. The cubs, which were a pale yellow color, ran south a few yards to a small group of trees. Then they turned back and ran toward the similarly colored bear who was apparently their mother. They ran off again, only to turn once more and run toward their mother. Then all five of them, at fast lope, ran south into the timber.

While Al and I were standing and

looking at one another and wondering what we would have done had they been on the warpath, all five returned again on the run, made a quick repeat of the past performance, and then took off to the west. We were very glad to have had the privilege of seeing this quintet, but we were also happy to see them leave.

No doubt the color phase of the cubs is what members of the Lewis and Clark Expedition referred to as "white" bears. It's also probably the reason why White Bear Island near Great Falls was so named.

When we broke camp the following morning, we took a different route than the one we came in on. We went north toward the Sun River and Teton Divide.

Near the summit, we encountered snowdrifts eight to 10 feet deep. When we got to where we could look out onto the Teton Valley country, we stopped and took some pictures.

Except for a few months, Al had spent the rest of his life in Teton County. He not only loved Montana, he lived it. He spoke of each stone, every blade of grass, each drop of water as though it were solely his possession. Those mountains were his special love. He would often get on his saddle horse and with a pack horse take off all alone to spend a few days in "the mountains."

I visited him in the rest home in Choteau a few weeks before he passed away. He asked me if I would take him to the mountains that afternoon. Of course, this wasn't possible.

If he dreamed as he went into his final sleep, I am sure those dreams were about Montana, about those mountains.

Since so many of your readers will relate to this experience, I thought you might like to publish my poem in *Montana Outdoors.—Barbara Magda Ophus, Big Sandy*

The Dedicated Elk Hunter

How lucky I am!
(How lucky he thought)
To draw a permit
It's an elk that I've sought.

So much fun
So much joy
I've dreamed of this
Since I was a boy.

I'll go out to get him
I'll peer through my scope
The rack that I'll see
Will excel wildest hope.

I'll buy a new rifle
A grand I'll lay down
Then a scope and some bullets
I'll go into town.

I've bought my license
And a tank full of gas
I'm almost ready
For the Bear's Paw at last.

We talked and we walked
We rode and we flew
All of my Sundays
I faithfully blew.

I should have gone sooner
Before the elk were riled
My hindsight is good
But where is my smile?

"No more work for me now,"
I told my boss
There's but one week left
I'll take the loss.

I won't give up now
I'm not a quitter
I'll settle for a cow
And forget all the glitter.

My knee is swelled
My feet got wet
But tomorrow I'll be ready
For another day yet.

My wife is lonely
My kids I've neglected
But an elk
I've not yet detected.

The days they came
The last week was passing
The pressure I felt
Was very harassing.

With one day to go
We heard the telephone sound
It was our son
The elk he had found.

I fired my gun
And my heart gave a shout
I had gotten my elk
There was no doubt.

I looked up to Him
And I closed my eyes
As I uttered my thanks—
Oh look at her size!

Twin Fawns

I was enjoying a great fishing trip (catch and release) on the Big Hole River approximately three miles southeast of Glen, Montana. I decided to take a break from fishing and inspect some of the old abandoned ranching equipment.

I rounded a large clump of willows and about 10 feet in front of me a deer jumped up from the high grass. I was startled, to say the least, but I noticed she had just given birth to twins! I took a picture and left the location immediately so she wouldn't abandon them. This happened on June 9 at 7 a.m.

I returned to the same location about 11:30 a.m., and the twins had moved about 20 feet. The doe was watching from the other side of the willows. I took three more pictures and then returned to the Herb Hall ranch.

Later that evening, we saw the doe grazing out in the meadow with the twins alongside. It made a beautiful picture, but by then it was too dark and too far away to record on film.—*Gene Butler; Carson City, Nevada*

Champion Donates Choice Wildlife Land

by Tucker Hill and Mike Aderhold

OVER A THREE-YEAR PERIOD, THE DREAM of a small group of northwestern Montana sportsmen took root and like a glacier lily in spring, pushed its way through the snows of skepticism and discouragement to a well-lit board room in Stamford, Connecticut.

The result: a spectacular donation of some of the finest lake and forest recreation land in the country.

On June 12, L.C. "Whitey" Heist, president and chief operating officer of Champion International Corporation, gave, on behalf of his organization and The Conservation Fund, 3,917.83 acres of choice wildlife land to Governor Stan Stephens, the people of Montana, and those who visit here.

The land stretches in bits and pieces for 23 miles along U.S. Highway 2, beginning 34 miles east of Libby to 28 miles west of Kalispell. The donation involves lakeshore and adjacent lands surrounding parts of McGregor; Lower, Middle, and Upper Thompson; Little McGregor; Loon; Crystal; and Horseshoe lakes, and 13 smaller lakes in a complex locally known as the Thompson Chain-of-Lakes.

This area is unusually rich in wildlife. The lands are used as winter range by moose, elk, and mule deer. White-tailed deer use the area year round and black bears occasionally visit the lands in spring and fall.

The lakes and their tributaries support a variety of waterfowl and wading birds, mink, beavers, otters, muskrats, and dozens of other mammals and birds. Wolves and mountain lions have been observed in the area. Loons summer on most of the lakes, and eagles and ospreys nest in the area. There is a great blue heron rookery on Horseshoe Lake.

All of the lakes support fish, and some offer excellent fishing. Game fish inhabiting the chain include rainbow, westslope cutthroat, lake, and brook trout; kokanee salmon; largemouth bass and smallmouth bass; northern pike; and yellow perch. McGregor Lake produces lake trout weighing up to 20 pounds, Middle and Lower Thompson lakes produce rainbow trout up to 12 pounds, and Crystal Lake produces kokanee salmon up to 18 inches long. Loon and Middle Thompson lakes provide excellent fishing for largemouth bass.

Champion International President and Chief Operating Officer L.C. "Whitey" Heist presents a spectacular donation of wildlife land to Montana Governor Stan Stephens.

Two timber companies, Champion International and Plum Creek (Burlington Northern), own 65% and 35% of the shoreline, respectively. Over the years, these companies have modified their cutting practices along the lakeshores so that conditions have remained attractive for recreational use. There is still an impressive amount of old-growth ponderosa pine and Douglas-fir around the area.

The assessed value of the donation exceeds $4.5 million, but the value for future generations is incalculable. As Champion's president Heist said in the dedication ceremony, "The real importance is not in the money, but in the fact that for everyone who has any reason to pass through here, they will have the opportunity to experience this special place. We give this land as a measure of our respect for what Montana has given us, and as a gesture of our confidence in the future."

SEVERAL YEARS AGO, members of Flathead Wildlife, Inc., the Kalispell affiliate of the National Wildlife Federation, began dreaming about trying to find a way to purchase and preserve some of this land for wildlife.

Three years ago, the U.S. Forest Service's Washington, D.C., and Region One land acquisition staff looked at the area and the Department of Fish, Wildlife & Parks (FW&P) began talking with Champion and Plum Creek officials.

In the spring of 1988, Flathead Wildlife, Inc. took on as their mission promotion of a purchase and members carried the idea to every organization in northwestern Montana that would listen to them. Late in 1988, Montana's congressional delegation was briefed and the Montana office of The Nature Conservancy, through its national board of directors, contacted Champion International officers in Connecticut.

In typical Montana fashion, 46 organizations sent Flathead Wildlife, Inc. letters of support. Hundreds of individ-

uals spread the word and pushed the idea.

Champion International Corporation collaborated with The Conservation Fund, a small, nonprofit, Arlington, Virginia, organization founded in 1985, that specializes in working with public agencies and the private sector in conservation transactions. They worked out a donation/payment agreement that helped all involved.

DURING THE DECADE OF THE 1880s, Montana's population tripled. The Northern Pacific Railroad started across Montana. It required 3,000 rail road ties per mile and wood for station houses, trestles, and bridges. Ore deposits in Butte caused it to be called "the richest hill on earth," and competing mines required thousands of board feet of timber to shore tunnels and fuel the smelting process.

The railroad didn't want to get into the timber business, so it formed a partnership with the Anaconda Mining Company for lumber. Anaconda purchased, and otherwise acquired, prime timberlands throughout western Montana. Some of their richest holdings were in the Thompson River drainage and included the Chain-of-Lakes area.

Late in 1972, Champion International paid the Anaconda Company $114 million for about 670,000 acres of timberland and some manufacturing facilities in western Montana. The Chain-of-Lakes lands were part of this purchase. With this purchase and the merger with the St. Regis Corporation in the early '80s, it gave Champion International 6.4 million acres of timberland in the United States, with nearly 900,000 acres in western Montana.

CHAMPION INTERNATIONAL CORPORATION WAS FORMED IN 1967, when the U.S. Plywood Corporation merged with Champion Papers, Inc. The company is involved in two basic businesses: building materials and paper. It has operations in Canada and Brazil, and is active in a number of locations throughout the United States.

The company employs over 30,000 men and women and ranks high on the list of leading industrial companies in America.

From the FW&P perspective, Champion International's donation was a perfect gift—unsolicited and unexpected. Conservation efforts in Montana had been geared to a purchase, but the money looked impossible to come by.

Plans for managing the resource are under way, and this fall two of the smaller lakes will be improved for game fish. The department is optimistic it will find ways to protect and enhance the many values the areas offer.

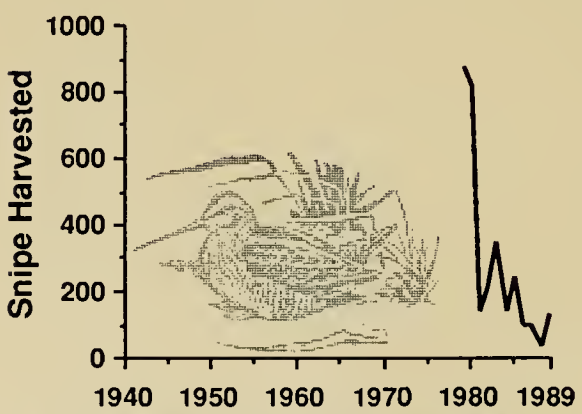
Thank you, Champion International.■

continued from page 6

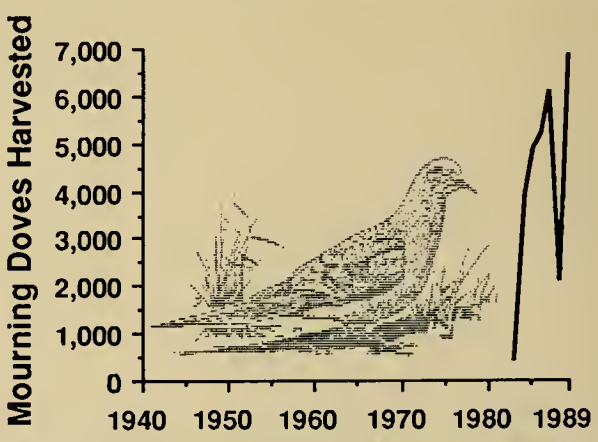
influenced duck, goose, and upland game bird populations and/or harvest survey results.

IT IS IMPORTANT TO RECOGNIZE THAT HARVEST SURVEYS are just one of many tools used in the department's wildlife management program, where the essence of the program is to maintain healthy and viable wildlife populations across the broad diversity of habitats that exist in Montana. At one time, these surveys provided the only index to the size of game populations. Although results from these surveys furnished us with a value or measurement of hunter success and hunting pressure, many other less tangible but as important—or more important—wildlife values are enjoyed by hunter and non-hunter alike. These include photographing, viewing, and just simply enjoying wildlife. Hunters measure the success of their outdoor experience by more than the killing of their prey. The camaraderie, enjoyment of nature, exercise, stimulation of senses, and overall appreciation of life processes all play an important role in determining why some people like to hunt.■

• *Much of the information in this article came from "Game Management in Montana," published in 1971 and edited by Thomas W. Mussehl and F.W. Howell.*—Ed.



Year of least harvested and (number harvested)—1988 (37)
Year of most harvested and (number harvested)—1979 (881)
1989 harvest—133



Year of least harvested and (number harvested)—1983 (450)
Year of most harvested and (number harvested)—1989 (6,927)
1989 harvest—6,927

LIES MY GUIDE TOLD ME

by Greg Tollefson illustrated by Dave McGee

MY FOREARMS WERE NUMB and my lower back ached from pushing the boat into an upstream wind all afternoon, so I felt almost giddy when we rounded the last bend and the take-out came into view. After 10 hours on the water, I was almost too tired to talk. For three straight days the wind and the rain had been pounding at us on the Madison. My body was telling me I needed a change in the weather or a day off. Soon!

Despite it all, the fishing had been pretty good. The customers were happy. And even as I turned the stern into shore and started pulling the boat toward the ramp, Cecil was still casting away without paying attention, and still talking nonstop. I will always remember the last words he spoke as the boat slid to a stop in the gravely shallows.

Cecil stood there, his line snarled in the stream bank willows behind him, and gazed out at the river. "How deep is this river, Bucky?"

It was his umpteen-thousandth question of our three days together. We had floated the same stretch of the Madison on each of those days. We had worked slowly, covering both sides of the river, examining riffles and eddies, checking out holding water, exploring back channels, and leaving no stone unturned. Cecil had waded lots of it. He had felt the bottom of much of the river underfoot, and he had seen the rest as the boat slid over it. He had even fallen in twice, both times while playing good fish. The first time, he was standing in the bow.

"Okay Cece," I had said, "I'm going to pull in to shore so you'll have room to work him. Don't get out till I tell you."

Well, Cecil gets excited. You know how it is. He didn't hear a word. He stepped out of the boat right there, and down he went. I followed him by tracking his rod tip, which he held high, playing that fish the whole time. When he drifted into the shallows, he must have weighed 300 pounds, counting the water in his waders.

"Were you saying something when I got out of the boat?" He seemed sincere in the asking.

"Nah, Cece, forget it."

The next time I had him beached on a sandbar in mid-channel while he worked a fat brown. Cecil kept backing up and paying out line so that for every foot the fish came in, Cecil was backing up three. By the time he had the fish in close, he had reached the water on the back side of the bar, and backed right into a hole. I grabbed his hat before it floated away.

"Do all of these islands drop off like that?" Cecil asked in what seemed to be seriousness.

"No, just this one." I thought the joke was obvious.

"Isn't a guide supposed to tell you stuff like that?" A puzzled look furrowed his brow.

HE HAD ASKED QUESTIONS from the first moment of the first day on topics ranging from geology and hydrology to social anthropology. All questions, of course, for which any self-respecting guide would manufacture an answer.

By the time we pulled out of the water on the third day, my mind reeled with information I had generated in response, as I desperately tried to catalog it so I could call it up again if the conversation returned to a certain topic. I didn't want to say anything to contradict what I had already told him. But now I was tired. And now he was asking how deep the river was.

Cecil is an extreme case, I'll admit that, but there is a little bit of Cecil in almost every customer I guide. You see, fishing guides are advertised as experienced and knowledgeable trout finders, which we generally are to some extent. The problem is that many customers think that means guides know everything there is to know. They don't stop to think that if we did, we would all be consultants, bringing in big fees and spending our abundance of free time fishing ourselves. We wouldn't be watching them have all the fun for a few bucks a day.

For example, I am not an aquatic ecologist. I know there are caddisflies and salmonflies and other stoneflies and so forth, and I can look at them and see how big they are, and what color they are, and I can generally figure out what fly to use. But I do not know their scientific names, and I don't want to.

So one day when a customer asked me how the Tricorythodes hatch was on a particular stretch of river, I spoke quickly. "Kind of spotty, really," I said, not having the foggiest idea what he was talking about.

The next day, another client and I started early to take advantage of clouds of "Tricos" that always came off just after daylight. When my customer remarked on the "heavy Tricorythodes hatch," I was surprised. And glad, too, that the other fellow had already left for his home on the Coast. If he ever comes again, and happens onto the Trico hatch with me, I will tell him it is a new phenomenon that biologists are feverishly studying.

I use "the biologists are studying it" ploy quite a bit when customers pose puzzling questions. For example, do horses on the bank scare trout? How many fish does an osprey take in a day? Or, how long does it take for a fish to feed again after it has been caught and released? One guy even asked whether fish recognize people who fish the same place often.

Oh sure, once in a while I just tell them I don't know, but usually I try to come up with something. There is generally some anecdotal evidence to support an answer. When a customer catches a fish with a fly in its jaw that the same customer had broken off moments before, that can answer the question about how soon they'll feed again, for example. And such an incident can be embellished and developed to apply to all fish everywhere, if necessary. But for many questions you just have to make something up from scratch, especially when floating unfamiliar water.

Despite the fact that most guides

". . . a customer asked me how the Tricorythodes hatch was . . ."

"Ain't no trout in here. Never was."

claim intimate knowledge of the waters in a particular region, there are usually some holes in their experience. One year we had some customers who insisted on floating a stretch of river they had heard about somewhere. Each guide—there were three of us—had been on that stretch at least once in our lives, but none of us remembered much about it. We didn't belabor that lack of familiarity when we agreed to the float.

Well, the fishing was tough that day. In fact, nobody in any of the boats landed a trout. A few bugle beaks, one of the local monikers for whitefish, were all that brightened the day.

Here are some things I remember saying that day:

"We usually do better in here real early in the morning."

"Surface action isn't always real good through here. Too bad neither of you guys has a sinking line."

"We like this stretch later in the year after the fish move down out of the tributaries."

"I heard something about a big fish kill in here a while back. I wonder if that has something to do with it."

"Things ought to pick up after lunch."

"The fish should be waking up toward evening."

"This is a strange stretch, some days you do well in the holding water, sometimes it's the riffles, and sometimes it's the dead scummy stuff."

"There generally aren't many fish here, but when you do get one, it's usually a real fish."

By the end of that day, I was nearly out of things to say. "Well boys, mama warned me about days like this. There's always tomorrow." I tried to cheer them up with an original line.

As I unloaded the boat at the take-out, a little kid, maybe 10 years old, came pedaling up on his bike. He sized us up suspiciously, then approached one of my disgruntled customers.

"You guys been fishin'?" the kid asked, as he lounged on his bike, one leg dangling over the crossbar.

"We sure have young fella, but we didn't do much good. Probably should have had a guy like you along to show us how."

"Don't know what good that woulda done. Ain't no trout in here. Never was. We always go up river about 20 miles."

I glanced away, trying to look busy with something.

FISH SIZE, OF COURSE, is another area where imagination comes in handy. I'm a pretty fair judge. Usually I come within a half inch or so when I estimate length, and the weight is almost always within a pound, one way or another, from what I suggest. When a customer recounts a fish story, though, to someone who wasn't there, the fish is always at least an inch, usually two, longer, and the weight increases correspondingly.

The guide must be ready to back up a customer's claim, no matter how it makes him feel—that is, if the guide wants a tip. People might think it's easy for a guide to lie about a fish for a customer, what with their extensive experience in shading the truth and manufacturing facts from thin air to keep conversations going. But it isn't so. That's because, as you should all know, guides never ever lie about the size of fish they catch themselves.

So there I am, more or less collapsed over the oars. Cecil's hung up in the

bushes and still doesn't know it. And he's asking me how deep the Madison River is.

I could tell him he should know as well as I, since he has waded in it, fallen in it, and floated it for three days. But that would be a little too sarcastic, and Cecil, being a nice, well-meaning guy,

"Cecil's hung up in the bushes and still doesn't know it."

doesn't deserve that. I could give him some exact measurement off the top of my head, like I have been for days with lots of his questions, whether I knew the answer or not. I could even tell him I really had no idea. I paused for a while, weighing the alternatives. Finally, I decided to try something new. I would tell the truth.

"It varies, Cecil."■

Back Cover—It's Also a Poster

The Montana Chapter of the American Fisheries Society is trying to advance public understanding of the need to take care of the fishery resource. As part of their efforts, they commissioned Helena artist Shirley Cleary to create a poster. Her depiction of a fishing scene on the Missouri River graces our back cover, and a limited edition of 500 signed prints is available.

The poster emphasizes that with proper stewardship, fishery resources will continue to be enjoyed by future generations. The poster costs $20 (plus $5 for postage) and can be ordered from Polly Bailey, 4 Harrison Avenue; Helena, MT 59601.

The American Fisheries Society is a scientific and professional organization composed of persons interested in the conservation and enhancement of fishery resources. The group's goals include: (1) advancing the conservation, development, and wise use of fishery resources for optimum use and enjoyment by all mankind; (2) gathering and disseminating information on fishery science and management; and (3) promoting and evaluating the educational, scientific, and technical aspects of the fishery profession.

CRAIG JOURDONNAIS

BOWS, ARROWS and BULLS

by Tom Lemke

INTEREST IN BOWHUNTING has increased dramatically in the past 20 years. Archery license sales in Montana have increased from 2,129 in 1968—the first year an early archery season was held—to 22,037 in 1987. During this period, sportsmen have debated—sometimes vigorously—the pros and cons of archery and how it fits into Montana's elk hunting picture.

Commonly asked questions include: (1) How many adult bull elk do archers take? (2) Does bowhunting interfere with elk breeding behavior? (3) Does bowhunting displace elk, making them more difficult to hunt in the general season? (4) How significant is wounding loss during the archery season?

In 1987, the Montana Legislature asked the Department of Fish, Wildlife & Parks (FW&P) to evaluate the impacts of archery hunting on elk and present its findings to the 1989 Legislature. In preparing its response, FW&P sought information from Montana bowhunters, evaluated data from radio-collared elk, and contacted other wildlife agencies in the western U.S. and Canada. This article summarizes the report presented to the Legislature last year.

TO ADDRESS THE QUESTIONS posed above and to learn more about bowhunting in Montana, FW&P sent

questionnaires to 15,975 resident archers. More than 8,000 questionnaires were returned, for a response rate of 54%. The results revealed a great deal about archers, their attitudes toward elk management, and their reasons for hunting with a bow.

When bowhunters were asked if they were generally satisfied with bowhunting opportunities in Montana, 79% said yes. When asked why they like to archery hunt, the top three choices were, "it's a challenging way to hunt," "there is less hunter congestion/competition," and "it expands my hunting opportunity."

When asked which of several possible improvements they would like to see made first, the most frequent response, chosen by 20% of the respondents, was "no improvement necessary." Second and third choices were, "increase big game populations" (18%), and "require all bowhunters to pass an archery education course" (16%).

The survey showed most Montana bowhunters (86%) use a modern hi-tech compound bow. Fewer use recurve bows and less than 1% shoot primitive long bows.

Although bowhunting can be extremely exciting, few arrows are actually shot at elk. The majority of bowhunters in 1987 (64%) did not take a single shot at an elk, while 21% took only one shot during the season. A few hunters had two or more opportunities.

Although many people believe archers are a new breed of specialists, the survey showed 92% of all bowhunters are also rifle hunters. Most of the hunters who start the season in camouflage end up in hunter orange!

The average archery elk hunter has been bowhunting for six years. He or she has probably killed one elk in that period, since the average bowhunter kills one elk for every five years of bowhunting.

Bowhunters tend to spend more days afield than rifle hunters. In 1987, resident archers spent an average of eight days bowhunting for elk, compared with six days for rifle hunters.

How much money do archers spend pursuing their sport? In 1987, the average resident archer spent an estimated $117 on travel, $75 on food, and $120 on equipment, for a total of $312. Based on 15,975 resident bowhunters, expenditures topped $4.9 million. Nonresident archers no doubt spent more on an individual basis than resident archers.

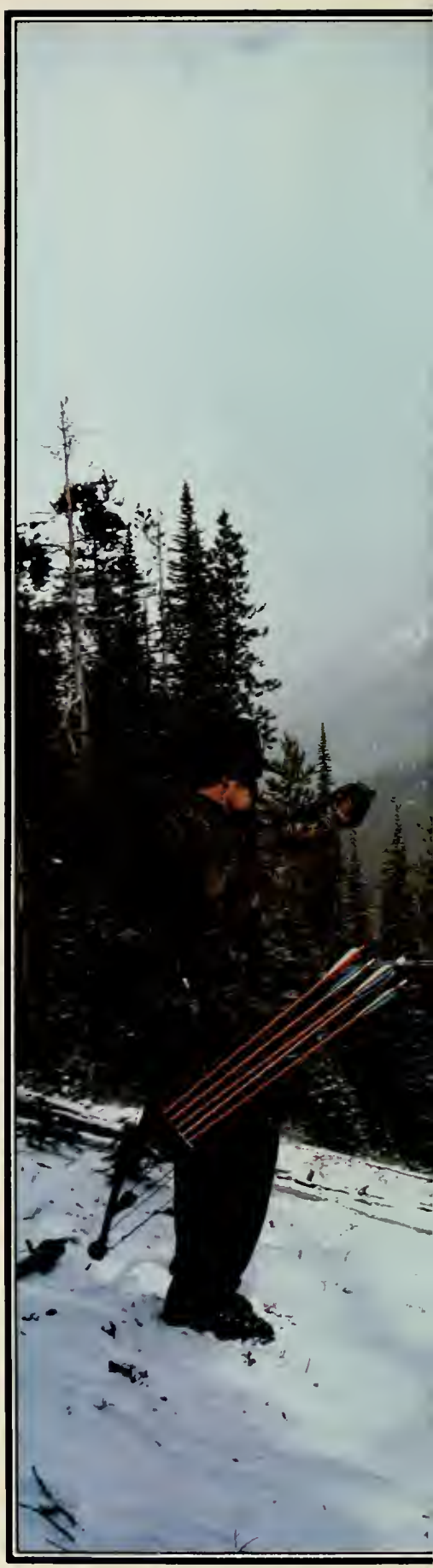
How many elk do Montana bowhunters harvest? In 1987, they tagged 850 elk (511 bulls, 317 antlerless, 22 unknown). One of 20 archers was successful, for a success rate of 5%. The archery harvest typically accounts for 3% to 5% of the statewide elk harvest.

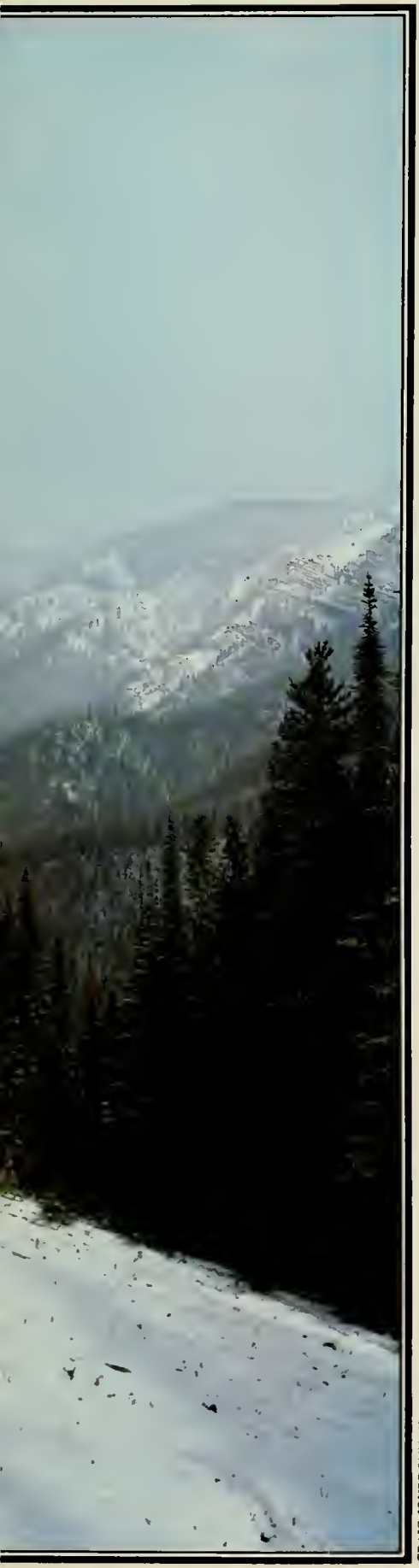
Where do bowhunters harvest their elk? Just about everywhere in Montana. In 1987, archers killed elk in all seven FW&P regions, and in 108 hunting districts. Southwestern Montana (Region 3) accounted for 31% of all elk taken by archers in 1987.

BIOLOGISTS MONITORED THE BEHAVIOR AND SURVIVAL of 729 marked elk (535 with radio collars) in three areas of Montana to assess effects of bowhunting. During a six-year period, only 11 (1.5%) of these animals were killed by archers, while 262 (36%) were taken by rifle hunters.

In the Elkhorn Mountains near Helena, 212 elk (110 bulls, 102 cows) were radio-collared between 1982 and 1987. During this interval, four elk (two bulls, two cows) were harvested by archers and another three (two bulls, one cow) died as a result of arrow wounds. Over the same period, 78 radio-collared elk (55 bulls, 23 cows) were harvested by rifle hunters and another four (two bulls, two cows) died from rifle wounds. Archery hunting accounted for 6% of the total annual elk mortality in the Elkhorns, while rifle hunting accounted for 70%.

In the Little Belt Mountains north of White Sulphur Springs, 143 elk (72 bulls, 71 cows) were marked and monitored from 1983 to 1988. During this period, 57 of the 72 marked bulls were harvested by rifle hunters, including four that died from wounds. Fourteen of the 71 cows were killed by rifle hunters. Although this area receives considerable bowhunting pressure, none of the marked elk was killed by archers during the six-year period. Overall harvest data for the Little Belts indicate bowhunters





CRAIG JOURDONNAIS

accounted for 2.6% and 1.6% of the bull harvest in 1986 and 1987, respectively.

The movements of 10 radio-collared elk in the Little Belts were monitored during the 1987 and 1988 archery seasons and compared with home range movements from June 1 to mid-August. The activity patterns were similar, indicating no major disturbances attributable to bowhunting.

Of 374 elk marked between 1984 and 1988 in the Gravelly Mountains southeast of Dillon, three (one bull, two cows) were harvested by archers, and another bull was lost to wounding. During this same period, rifle hunters took 106 (28%) of the 374 marked elk, including five lost to wounding.

In one hunting district in the Gravelly Range, several radio-collared elk were monitored weekly from late August to mid-October between 1986 and 1988. This unit had no archery season in 1986 and 1987, but in 1988 an archery season was instituted. Elk activity patterns in 1988 did not differ from those of 1986 and 1987.

TO TAP THE CUMULATIVE EXPERIENCE of elk managers throughout the Rocky Mountain West, we surveyed wildlife agencies from nine western states (including Montana) and two provinces. The agencies provided information on elk archery seasons, participation rates, harvest trends, and management concerns.

All 11 states and provinces have early archery elk seasons that range in length from eight to 43 days, with portions including the elk breeding season. Colorado and Oregon have experimented with the length and timing of bow seasons for years, while British Columbia recently initiated its first early archery season on a trial basis. Idaho, Oregon, Washington, Wyoming, and Alberta have regular late-season (November-December) archery hunts in some districts. Montana, New Mexico, Alberta, and British Columbia also allow hunters to use bows during the general rifle season.

Based on estimates from these 11 agencies, 84,845 people hunted elk with bows in 1986, compared with 606,000 who hunted with rifles. Bowhunters made up 7% to 15% of the elk hunters in most of these states and provinces (the exception was Arizona, where 36% of the elk licenses are set aside for bowhunters). Looking at five-year trends, six agencies (including Montana) reported a moderate increase in the number of bowhunters, three were stable, and two experienced some decline in bowhunter participation.

How many elk are being taken by archers in the western U.S. and Canada? In 1986, from an estimated total harvest of 102,867 elk, 6,967 elk (6%) were taken by archers. For the past five years, archery kills have constituted 1% to 9% of the total annual elk harvest in each state or province. The bowhunter success rate ranges from 5% to 16% in each of these areas—lower in every case than the rifle hunter success rate, which ranges from 9% to 48%. Five agencies reported an increase in archery elk harvest since 1982, while six (including Montana) reported a relatively stable bowhunting harvest. None of the agencies indicated a decline.

How does Montana's archery elk hunting compare with other areas? Montana has the longest and most liberal elk archery season in North America. We do not restrict sportsmen in their choice of weapon and we maintain a 43-day either-sex archery season over most of the state.

In 1986, Montana had the second largest number of archers (Oregon had the most), while our estimated archery harvest ranked fifth behind Oregon, Colorado, Idaho, and Washington. Oregon bowhunters harvested 1,574 elk in 1986, more than twice the number taken in Montana. Our archery success rate of 6% was among the lowest. From 1982 to 1986, Montana showed a 24% increase in number of bowhunters, while harvest levels remained relatively stable. The number of bowhunters did not increase as sharply in Montana as it did in many other states during this interval.

EARLY ARCHERY SEASONS have been conducted in Montana for 22 years and continue to be a popular form of recreation. Recently, early seasons have generated thoughtful questions on the

Bowhunters thrill to the challenge of a bugling bull.

MIKE LOGAN

impact of bowhunting on wildlife populations.

The statewide archery survey discussed above provides the best and most recent information on several aspects of bowhunting in Montana. Regarding the most commonly asked questions, the findings are:

(1) The survey indicates that bowhunters do not harvest a large number of elk. The archery harvest averages from 3% to 5% of the annual statewide elk harvest and individual success rates for bowhunters are much lower than success rates for rifle hunters.

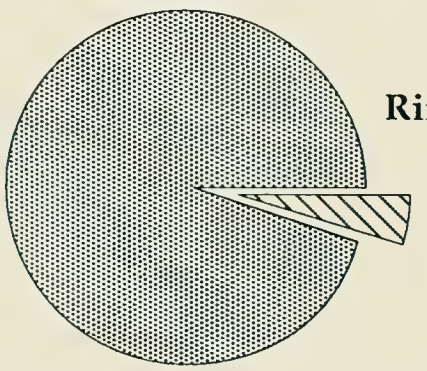
(2) Based on population surveys and relocations of radio-collared elk in three Montana study areas, there is no biological evidence to indicate that bowhunting significantly interferes with elk reproduction or noticeably displaces elk from one area to another.

(3) From the known fates of 535 radio-collared elk, the wounding loss during the general rifle season was three times greater than the wounding loss associated with bowhunting (13 elk vs. four elk).

In general, bowhunters are satisfied with the opportunities available in Montana. They are drawn to the sport because of its challenging nature and the chance to hunt in relative solitude compared with the general rifle season. If a bowhunter sticks diligently with the sport, he or she is likely to harvest one elk every five or six years.

Resident bowhunters contributed an estimated minimum of $4.9 million to the state's economy, based on expenditures for food, travel, and equipment. The average archer also spends 30% more days afield than the average rifle hunter. Ninety-two percent of Montana's bowhunters also hunt big game with a rifle.

Most concerns expressed about bowhunting appear to come from public perception and social preferences rather than available biological information. Better public information is important in developing informed opinions and sound management decisions regarding bowhunting in Montana. ■

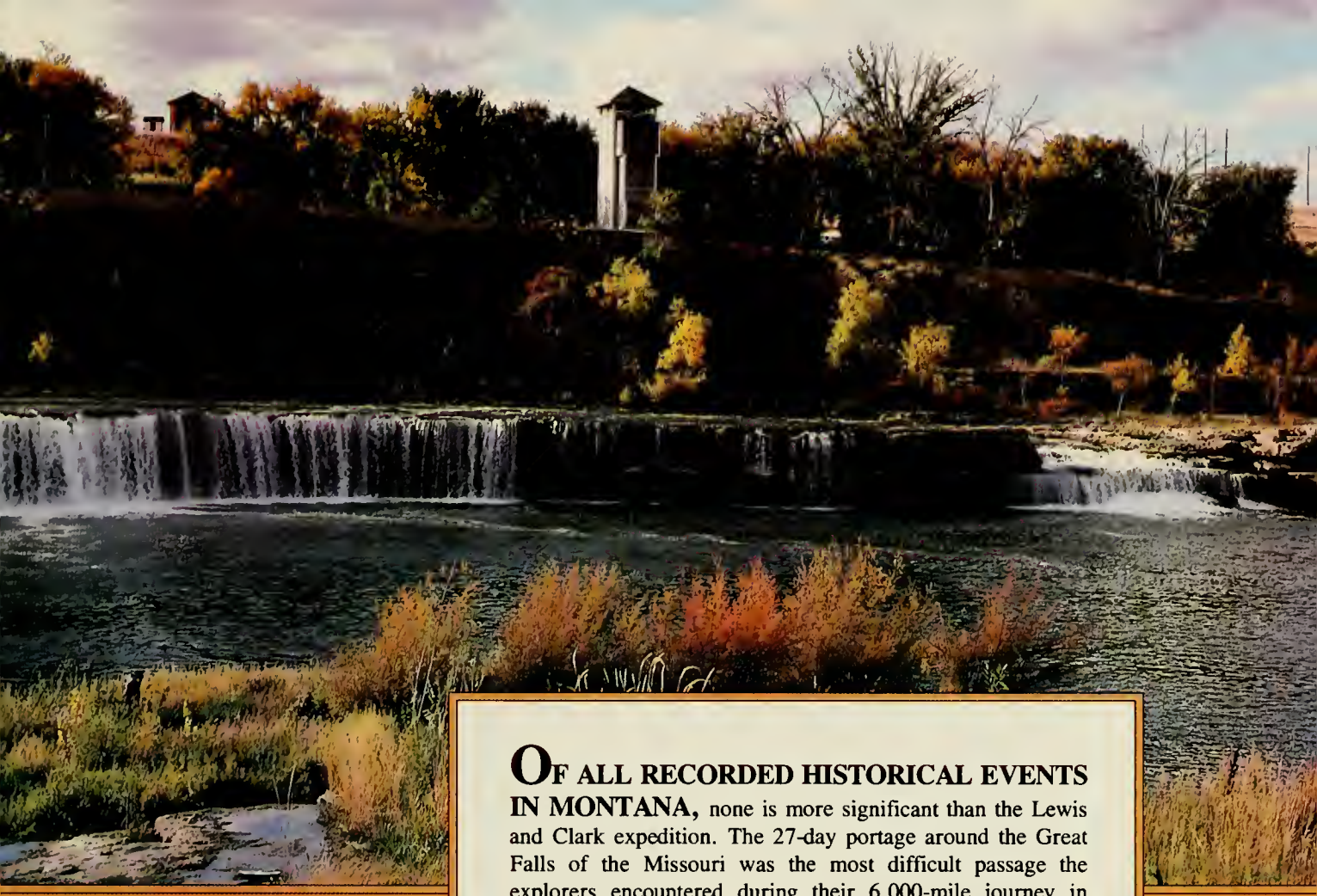


Rifle Harvest—95%

Archery Harvest—5%

MONTANA'S TOTAL ELK HARVEST FOR 1987
15,551 ELK

Archery Harvest—850 Elk



Crooked Falls.

FW&P PHOTO

GIANT SPRINGS: The Big Bubbly

by Harley W. Yeager

OF ALL RECORDED HISTORICAL EVENTS IN MONTANA, none is more significant than the Lewis and Clark expedition. The 27-day portage around the Great Falls of the Missouri was the most difficult passage the explorers encountered during their 6,000-mile journey in 1804-06.

Perhaps the most impressive discovery of the portage encampment was a remarkable natural feature upstream from a series of waterfalls that includes the Great Falls of the Missouri. On June 18, 1805, Captain Meriwether Lewis wrote in his diary: "The largest fountain I ever saw and doubt if it is not the largest in America...." Little did Captain Lewis realize that this large fountain—which spews as much as 192 million gallons of water per day—would attract some 250,000 visitors annually to what is now Giant Springs Heritage State Park.

Since the days of Meriwether Lewis, visionary citizens of Great Falls, including founder Paris Gibson and later, members of the Lewis and Clark Heritage State Park Commission were largely responsible for development and

expansion of Giant Springs State Park. Following fund-raising efforts by the citizen park commission group, a 43-acre addition was purchased in 1977 and the enlarged park was re-named Giant Springs Heritage State Park. Combined with state and federal funds, additional money raised by the Giant Springs Heritage Park Commission was used to develop the new park site and upgrade the original Giant Springs State Park. More recently, the Giant Springs Heritage State Park Commission raised $40,000 by selling miniatures of a bronze of Canada geese that stands in front of the Region 4 (Great Falls) headquarters at Giant Springs (see "Bronzes Help Heritage Park," *Montana Outdoors*, July/August 1988). Coupled with a large donation of land by the Montana Power Company and 25 acres of surplus Fish, Wildlife & Parks land in Helena traded with the MPC, a 105-acre addition to Giant Springs Heritage State Park became possible. The land acquisition was dedicated by Governor Stan Stephens May 31, 1990, at a site just yards from the spot where Captain Lewis first viewed these springs 185 years earlier.

THE NEWLY ACQUIRED LAND IS THE FUTURE HOME for the Lewis and Clark National Historic Trail Interpretive Center. Local officials and citizens and federal and state agencies are seeking a $9.4 million federal appropriation for planning and construction of the new center and associated activity areas. If approved by Congress, the project is scheduled for completion during 1993. The center will be staffed by personnel from the Lewis and Clark National Forest.

The Region 4 Headquarters for the Montana Department of Fish, Wildlife & Parks and its accompanying Visitor Center are some of the latest additions to the Giant Springs Heritage State Park complex. Completed in 1987, the Headquarters/ Visitor Center serves a dual purpose: a business office for the state agency and an interpretive facility for the public. The Visitor Center theme is "The River Brought Us Here," which ties present to past with several displays. Also, mounted wildlife and a mini-video theatre are available for the public's enjoyment. The center is staffed, in part, by over 70 volunteers. Groups larger than 25 wanting to use the facility should make advance arrangements by calling 406/454-3441. Business hours are 8 a.m. to 5 p.m., Monday through Friday. Visitor Center hours are 8 a.m. to 7 p.m., summer weekdays; 10 a.m. to 7 p.m., weekends and holidays; 8 a.m. to 5 p.m. winter weekdays. A public meeting room is available for use by conservation groups.

Giant Springs Trout Hatchery is a short distance from the Region 4 Headquarters and Visitor Center. This state-of-the-art hatchery was completely rebuilt in 1985 and is the temporary home of up to 1 million rainbow trout and 1 million kokanee salmon each year. An outside pond and raceways full of fish complement the push-button audio-interpreted Visitor Center, aquarium, and inside raceways where the modern role of hatcheries in Montana's fish management program is explained.

Just outside the hatchery Visitor Center and adjacent to the show pond is the Roe River, recognized by the "1990 Guinness Book of World Records" as the world's shortest river. With an average length of 201 feet, the Roe flows its record short distance to the Missouri from Giant Springs.

Another outstanding feature of the Giant Springs Heritage State complex is the developed scenic overlooks where visitors can view some of the same waterfalls seen by Lewis and Clark as they explored the Great Falls of the Missouri and planned their portage. With the help of local volunteer labor and donated materials and services, two of a series of planned overlooks were built on the bluffs overlooking Rainbow Falls and upstream from Crooked Falls. The other three falls that prevented the Lewis and Clark expedition from continuing its journey directly up the Missouri are Black Eagle, just below Black Eagle Dam and still easily visible; Colter Falls, obscured by Cochran Dam; and Great Falls. Great Falls is not only the largest of the five falls but was the first one encountered by Lewis and Clark. To see this picturesque falls, take U.S. Highway 87 north of Great Falls to the Ryan Dam parking lot and cross the pedestrian bridge to Ryan Island.

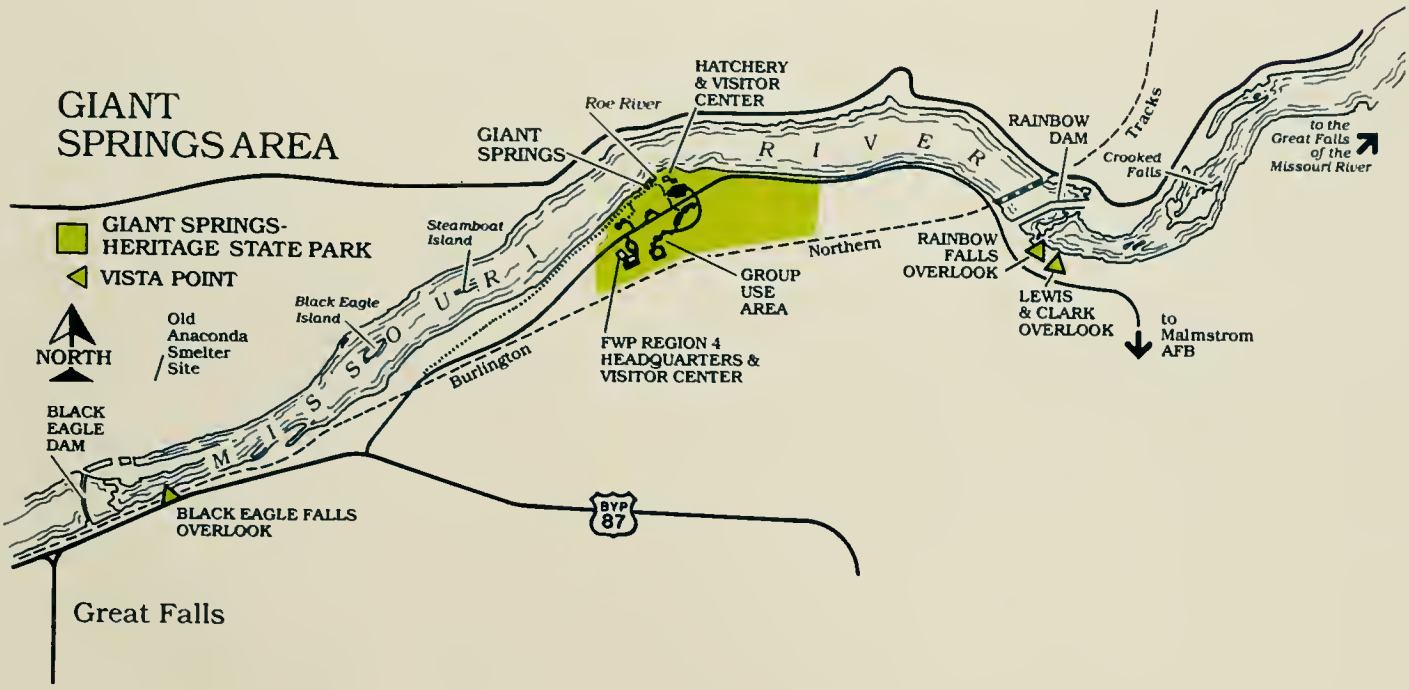
Giant Springs has a lot to offer—plan a visit before the snow flies. If you can't make it before then, bring your snow-shoes.■

Visitors to Giant Springs State Park can enjoy viewing Canada geese and rainbow trout, as well as visiting the new Region 4 Headquarters and its accompanying Visitor Center.

DAVE MCGEE

DAVE MCGEE

HARLEY YEAGER



FOR EVERYONE FOREVER

Montana's Fishery Resources

American Fisheries Society
Montana Chapter

PASS IT ON...